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IN this issue of the JOURNAL, we begin the publication of a lecture on Copper Smelting, delivered December 20th, 1880, at the Royal Institution of South Wales, Swansea, by the President of that Institution, Mr. HENRY HUSSEY VIVIAN, M.P. for Glamorganshire.

The subject, and the able manner in which it is treated by so high and practical an authority, are of sufficient importance to induce us to reproduce the lecture in full. We shall, therefore, continue it through successive numbers of the JOURNAL until completed.

We may state that copper smelting has been carried on in the Swansea District since the time of Queen Elizabeth, and for some generations the Messrs. VIVIAN, of the Hafod Copper-Works, Landore, Swansea, have been among the largest, if not the oldest, copper smelters in the district. Mr. JOHN HENRY VIVIAN, M.P., the present Mr. VIVIAN'S father, was actively engaged in copper smelting during the whole of his business lifetime, and the present Mr. H. H. VIVIAN has also been actively so employed for the past thirty-seven years. From such an authority, therefore, the information given will not only be of general use, but will be of special value to all those interested in the metallurgy of copper as perfected to-day in the South Welsh District. Mr. VIVIAN says: "The 'South Wales process' of copper smelting is now the dominant one of the whole world." The lecture first treats exhaustively of the history of copper and copper smelting from the earliest times, and then proceeds to define the "system" of copper smelting as practiced at Swansea, through its various "processes," until the final one of "refining" is reached, when Mr. VIVIAN graciously gives way, and reads what he characterizes as "an admirable description of our refining process, written by Mr. WILLIAM MORGAN, who has been a practical refiner all his life."

The exclusive source from which we have been enabled to reproduce the lecture is the *Cambrian*, of Swansea, in its issues of December 24th and 31st, 1880, copies of which, we are informed, were "all sold out the day of issue," and unfortunately, no additional copies containing the subject were printed. We advise those who wish to obtain the JOURNAL containing the reproduction to write at once for such copies as they may require. As an evidence of the value of the article, we have received the following from one of the practical copper smelters of this country, who has perused it. He says: "It is the most valuable article on copper smelting I have ever read. Be sure and reproduce it in full."

THE PENNSYLVANIA SURVEY.

We understand that the necessary appropriations for the continuance of the Pennsylvania Geological Survey are "hanging fire" in the Legislature of that State, and that the members of the corps will consequently be delayed in taking the field this season, even if the money shall finally be voted. This is the more to be regretted, since, so far as we are aware, there is no dissatisfaction with the survey or opposition to its continuance. The chorus of praise with which its labors have been received in all quarters, bearing witness to the singular success with which the demands both of theoretical science and of industry and trade have been satisfied, appears to have made considerable impression upon the representatives of the people. In fact, they have probably found that the people appreciate the value of this well-planned, carefully performed, and conveniently published work, and that attacks upon it are not popular. The present difficulty appears to be, that the long dead-lock over the choice of a U. S. Senator has disarranged the business of State legislation ; the legislators are distracted with pressing claims upon their attention ; they are trying to be, or to have the credit of being, economical, and yet to pass various measures of local importance appropriating money ; and in the confusion and conflict, nobody takes a special interest in merely general and permanent benefits to the State, such as this survey confers. The members from the anthracite districts ought to take this matter vigorously in hand ; since the work of a thorough revision and collation of the facts affecting the anthracite basins is the next great blessing to be anticipated, and its value can not well be too highly estimated. In this sense, the prompt support of the survey is of sufficient local importance to deserve the attention of politicians, even.

BRITISH EXPORTS OF IRON AND STEEL.

Messrs. W. W. & C. RICHARDSON, of London, have extracted the following figures from the government returns :

RAILWAY IRON EXPORTED TO	Month ended February.			Two months ended Feb.		
	1879.	1880.	1881.	1879.	1880.	1881.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
United States	737	12,842	14,937	812	28,169	22,858
Russia	.....	64	28	.....	64	102
Turkey	19	.....	67	459	.....	74
British India	12,529	6,872	5,475	16,624	23,358	9,918
British North America	167	.....	210	568	1,085	508
Egypt	1,173	2,035	155	1,194	2,926	2,028
Australia	2,892	4,028	6,354	9,451	6,973	12,194
Brazil	3,661	2,018	3,069	5,249	4,356	6,879
Holland	.....	.....	32	.....	.....	55
Spain and Canaries	1,815	687	579	3,602	1,896	859
Sweden and Norway	1,312	106	2	3,949	226	2
Chili	25	319	43	532	329	148
Denmark	5	.....	.....	5	1	1
Peru	263	348	200	432	447	449
Germany	.....	.....	.....	206	.....	.....
British Possessions in South Africa	214	1,470	192	1,036	1,748	590
Italy	143	352	1,206	154	1,735	4,874
Other countries	3,126	4,842	5,673	4,281	9,448	12,448
Total	28,081	35,983	38,852	48,554	82,761	73,987
Total exports from Great Britain of iron and steel to all countries	134,641	264,252	192,870	262,959	540,281	389,082
Estimated total of iron rails	2,648	8,841	10,945	7,123	19,984	18,029
" " steel rails	18,262	21,486	20,672	29,173	50,402	43,912
Total of rails	20,910	30,327	31,617	36,296	70,386	61,941
Exports of the following to the United States:						
Pig-iron	3,102	69,651	18,648	6,363	126,221	34,702
Old iron for remanufacture	381	29,529	5,190	567	54,501	10,724
Steel unwrought	307	2,908	5,517	775	5,500	9,292
Tin plates	9,137	10,257	11,114	18,132	27,276	23,291
Hoops and sheets	36	4,957	406	89	9,942	626
Bar, angle, bolt, and rod	32	6,526	791	191	13,345	1,876

The total of exports of all kinds of iron shows a falling off as compared with January of this year, and is quite discouraging as compared with February, 1880. The shipments to the United States show an improvement ; more particularly, however, in railroad material, the exports of which were even greater than in February, 1880, and nearly double what they were in January of this year. The crowded condition of the order-books of our own mills, at the very beginning of this year, led us to expect large shipments of railroad material from abroad.

NEW PUBLICATIONS.

A GLOSSARY OF MINING AND METALLURGICAL TERMS. *By* R. W. RAYMOND, PH.D. *From Vol. IX., Transactions of the American Institute of Mining Engineers.* Easton, Pa. 1881. Published by the Institute, at the Office of the Secretary. Octavo, 94 pp.

The Council of the Institute has caused an edition of this work to be printed and bound as a book, in advance of its publication as a paper in the next volume of Transactions. The measure appears to us a wise one. The value of such a glossary is undoubtedly enhanced by putting it in a convenient form ; and it is probable that many members of the Institute will avail themselves of the opportunity to secure for a few cents, by applying to the Secretary, a neatly bound separate copy of this

vocabulary. To say that it is better than any other of the same class with which we are acquainted, is to say little; since the glossaries in the English language are generally very poor. The great enlargement and improvement which we observe in this work, as compared with the preliminary edition, sent around, "subject to revision," after the manner of Institute papers generally, some months ago, are proofs of the generous and extensive co-operation given by the members, and the labor expended by the author, in perfecting what was at first but a promising beginning. A good deal might still be done, principally in the way of supplying omissions; the definitions, as they have now been corrected, seem to us pretty fair. We notice some typographical errors of an unimportant but provoking character, consisting in the slight displacement of title-words from their true alphabetical order—the result of clerical carelessness, if the labor of pasting together in proper sequence the slips of paper containing the definitions can be dignified with the term clerical. The words *grueso, green sand, gubbin, loam, mouth,* and possibly a few more are thus displaced. The defect is trifling, but we wonder that the author could overlook it in the proof, since the same party, acting as editor and critic, saw it in a minute! *

BRICKS WITHOUT STRAW. *A Novel, by* ALBION W. TOURGEE, LL.D., *late Judge of the Superior Court of North Carolina, Author of "A Fool's Errand," etc.* New York: Fords, Howard & Hulbert. 1880. Small 8vo, 521 pp. Price, $1.50.

Like its scarcely more famous and popular predecessor, *A Fool's Errand*, this book is more an argument and a picture than a story. As a narrative, it possesses, we think, more interest, and exhibits more art, than the other; as a presentation of the condition of a part of Southern society, it is equally powerful, but suffers inevitably the disadvantage of being the second operation on the same vein—a vein which, of course, can not remain forever productive. While *A Fool's Errand* sets forth the experiences of a Northern settler in the South, under the conditions of "reconstruction," the present volume deals rather with the peculiarities and fate of the freedmen. Both of them are notable instances of success in vivifying and effectively employing facts which have been buried in the ponderous tombs of Congressional documents. They seem to us remarkably careful and candid descriptions of the people, place, and period to which they refer. Doubtless there are many pictures of Southern society deserving to be painted in brighter colors: on the other hand, there are existing abuses darker than any which Judge TOURGEE has drawn—for instance, the system of slavery under the name of convict-labor, now in force in Georgia and other Southern States. These things have more to do with the difficulty of getting capital and enterprise to develop the resources of the South than our Southern friends are aware. *

ANTHRACITE COAL STATISTICS.

Mr. JOHN H. JONES furnishes the following figures of anthracite coal shipments:

	February, 1881.	February, 1880.	Difference. Increase.	For Year 1881.	For Year 1880.	Difference. Increase.
Phil. & Read. RR.	436,415.02	299,854.12	136,560.10	828,573.18	697,146.03	131,427.15
Lehigh Val. RR.	421,819.19	239,559.05	182,260.14	752,576.03	559,743.16	192,832.07
Cent. RR. of N. J.	323,209.08	152,747.07	170,462.01	560,023.09	432,524.11	127,498.18
Del., Lack. & W. RR.	360,125.15	231,876.01	128,249.14	629,452.12	512,305.05	117,147.07
Del. & Hud. Canal Co.	285,606.19	194,254.17	91,352.02	472,680.07	460,476.04	12,204.03
Pennsylvania RR.	141,838.17	90,569.14	51,269.03	297,580.17	186,734.13	110,846.04
Penn'a Coal Co.	106,153.08	67,942.09	38,210.19	176,088.12	154,473.01	22,515.11
N. Y., L. E. & W. RR.	43,004.06	19,765.18	23,238.08	72,943.06	57,482.08	15,460.12
Total.	2,118,173.14	1,296,570.03	821,603.11	3,790,818.18	3,060,886.01	729,932.17

The stock of coal on hand at tide-water shipping points, February 28th, 1881, was 395,286 tons; on January 31st, 1881, 417,885 tons; decrease, 22,599 tons.

The shipments only call for favorable comments as far as the companies are concerned, while the small stocks on hand at the end of February indicate that there was an unusually active market for coal.

THE NOVA SCOTIA MINING LAW.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In your editorial correspondence of February 19th, appeared a statement reflecting on the Mines Act of Nova Scotia.

The former law required that an "adequate" amount of ventilation should be produced. In England, this law has been found to work well, as the testimony of eminent independent mining experts can be readily procured; the offender is fined, and then the secretary of state can cancel his certificate. In Nova Scotia a comparatively small coal mining country, independent experts are not to be had, as all mine managers are working crown mines; and there can be no punishment inflicted beyond a fine, as no system of certificated managers exists. Mr. Poole, when inspector, alluded to their want of training in his report for 1875.

Your correspondent is incorrect, or rather misleading, when he speaks of the "mere naming of a definite quantity of air;" for the law specially limits the fixed minimum of air to pits not giving off gases, and states that when inflammable gases are evolved, more air must be applied. If such words give "a sense of security," your correspondent must have been easily lulled to sleep when an infant.

Your correspondent, however, bases his objection to the law on the possible dangerous results of circulating the fixed minimum in a shaft sunk in winter. Now, Mr. Editor, had his candor been equal to his anxiety to make a point (for political purposes) against the Nova Scotia government, he would have informed you that this noxious section is the first of the general rules, which the law, section 25, states "shall be observed, so far as is *reasonably practicable* in every mine." I should fancy this general clause would certainly cover the objectionable point on which he bases his criticisms.

I may add, in conclusion, that the miners are in favor of the amendment, as calculated to give them a constant supply of good air. Z.

HALIFAX, NOVA SCOTIA, March 17.

MONTANA MINING NEWS.

Special Correspondence of the Engineering and Mining Journal.

Never in the history of quartz mining in this territory has the prospect for future bullion product been as bright as at present. Of course, Butte takes the lead, and every thing indicates that she will long maintain it; for nowhere in the known mining world is there to be found such a network of valuable lodes as exist within a radius of five miles of the town of Butte.

The Alice has got fairly at work with the new mill, and her bullion product exceeds $100,000 per month. Her first dividend of $40,000 is paid to-day, and every thing indicates that she will long be able to maintain if not increase the same. The mine is now opening on the 700-foot level, where it shows no diminution in size or value.

Next to the Alice, in value, comes the Lexington, and it is only next for lack of development. From this mine above the water-level, which is only 85 feet, there have already been taken over one million dollars of gold and silver, and there still remain in sight above the water more than half a million dollars. The ore above water is comparatively free, and has been worked in a fifteen-stamp, free, wet-crushing mill. A large hoisting-works is about completed on this mine, and it is the intention of the fortunate owner, Judge A. J. Davis, to sink a large working-shaft at least 300 feet deep, this summer, and open the mine below water, when he will proceed to erect a mill commensurate to the wants of the mine. The Lexington is a parallel lode to the Alice, and is only distant fifteen hundred feet. A mine that produces $1,500,000 in 100 feet in depth requires no further comment.

Farther south come in the Gagnon, the National, and the Original, all on the same lode, and valuable mines, producing large quantities of rich silver-copper ore. About one million dollars have been produced from these three mines, and none of them shows any signs of weakening as depth is attained.

To the east, on the same lode, is the Parrot, an extensive copper mine, but not as rich in silver as the three just mentioned. The owners of the Parrot, the Parrot Copper Company, are just completing a smelting-works for their ore, and will soon be large producers of copper matte.

The Colusa, another large copper mine, is owned and operated by the New York & Montana Copper Company. The company has a concentrating and matting works, and is producing about ten tons of matte per day, besides shipping large quantities of its high-grade ore. Besides the Colusa, the company owns other valuable mines; but until its capacity for reduction is increased, they must remain idle.

The Colorado & Montana Smelting Company is another copper-matting establishment; but it uses silver and gold ores as well as copper, so that its product is a copper-silver matte usually carrying about $900 in gold and silver per ton. This is a branch of "Hill's Works," Colorado, and is as successfully operated as the parent establishment. The manager, Mr. H. Williams, most thoroughly understands his business.

The Silver Bow Company is the owner of several good mines and a No. 1 $20-stamp mill, with Howell White 60-inch furnace. The mill runs constantly, producing large amounts of bullion from its own and purchased ores.

The Dexter mill is kept busy on custom ores.

The mines that have no reduction-works are almost too numerous to mention. The Bell, just incorporated, is producing considerable rich copper-silver ore, and, with reduction-works of its own, will probably make its mark as a dividend-payer. The Anselmo, the Morning Star, the Star West, the Mountain Boy, and the Stevens are all producing ore in paying quantities, and all are ambitious to soon own large reduction-works of their own.

The Utah Northern Railroad will be completed to Butte in August; and from that time on, you may expect to hear Butte boom for years.

The outside camps are all doing well. In Silver Creek, twenty-five miles from Helena, the Belmont, the Gloster, the Blue Bird & Hickey, and the Drum Lomond keep up their regular shipments of bullion. At Phillipsburg, the Hope and Algonquin companies keep pounding away, and ship their usual quota of bullion. The Speckled Trout is producing base ore as usual. The Algonquin Company has just started its new hoisting-works, the most powerful and complete in the territory, and is about to open the 400-foot level.

The Granite Mountain is a new mine of great promise in this camp, and will probably soon be heard from "officially."

At Wickes, the Alta-Montana Company has finally found a bonanza in the Alta mine; the ore rich, averaging from 80 to 100 ounces, and existing in immense quantities. The question is, "What will '*Cole*' do with it?" The Bonanza Chief, near Helena, is running in good shape, the balance at the end of the month being on the right side, which fact is undoubtedly due to the careful management of Superintendent Stevens.

I will give my attention to others of the outside mines another time. In the near future, I will give you a special on the Moulton, which promises soon to rival its near relation and neighbor, the Alice.

I have not overlooked the Hecla Consolidated, of Glendale, nor many other deserving properties in other portions of the territory; but am compelled to close for want of time to do them justice. K.

THE MICA VEINS OF NORTH CAROLINA.*

By W. C. Kerr, State Geologist, Raleigh, North Carolina.

A brief sketch only is here intended, with a few illustrations, in order to give a general notion of the character and structure of these veins. I stated elsewhere, several years ago, that these veins were wrought on a large scale and for many ages by some ancient peoples, most probably the so-called mound-builders, although they built no mounds here, and have left no signs of any permanent habitation. They opened and worked a great many veins down to, or near, water-level; that is, as far as the action of atmospheric chemistry had softened the rock so that it was workable without metal tools, of the use of which no signs are apparent. Many of the largest and most profitable of the mines of the present day are simply the ancient mound-builders' mines re-opened and pushed into the hard undecomposed granite by powder and steel. Blocks of mica have often been found half imbedded in the face of the vein, with the tool-marks about it, showing the exact limit of the efficiency of those prehistoric mechanical appliances. As to the geological relations of these veins, they are found in the gneisses and schists of the Archæan horizons, in that subdivision which I have provisionally classed as Upper Laurentian, the Montalban of Dr. T. Sterry Hunt. These rocks are of very extensive occurrence in North Carolina, constituting, in fact, the great body of the rocks throughout the whole length of the State—some 400 miles east and west—being partially covered up, and interrupted here and there by belts of later formation. Mica veins are found here—in fact, may be said to characterize this horizon everywhere, from its eastern outcrop, near the seaboard, to and quite under the flanks of the Smoky Mountains. It is, however, in the great plateau of the west, between the Blue Ridge and the Smoky, that the mica veins reach their greatest development, and have given rise to a very new and profitable industry—new, and, at the same time, very old.

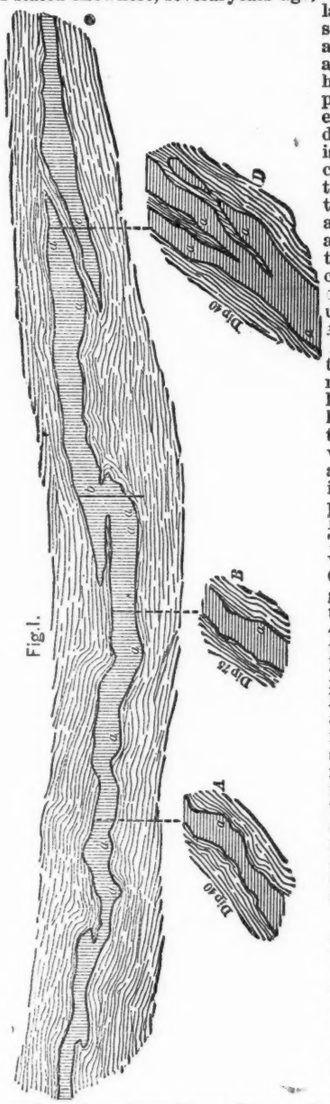


Fig. 1.

It may be stated as a very general, almost universal, fact, that the mica vein is a *bedded* vein. Its position (as to strike and dip) is dependent on and controlled by, and quite nearly conformable to, that of the rocks in which it occurs, and hence, as well as on account of their great size, some observers, accustomed to the study of veins and dikes and the characters of intrusive rocks in other regions, have been disposed to question the vein character of these masses at first. But a good exposure of a single one of them is generally sufficient to remove all doubt on this score. The mica vein is simply and always a dike of *very coarse granite*. It is of any size and shape, from a few inches—generally a few feet—to many rods (in some cases several hundred feet) in thickness, and in length from a few rods to many hundred yards, extending in some cases to half a mile and more. The strike, like that of the inclosing rocks, is generally northeast, and the dip southeast, at a pretty high angle; but they are subject, in these respects, to many and great local variations, all the conditions being occasionally changed, or even reversed. An idea may be formed of the coarseness of these veins from this statement, that the masses of cleavable feldspar and of quartz (limpid, pale yellow, brown, or, more generally, slightly smoky), and of mica, are often found to measure several yards in two or three of their dimensions, and weighing several tons. I have a feldspar *crystal* from one of these mines of nearly a thousand pounds weight, and I have known a single block of mica to make two full two-horse wagon-loads, and sheets of mica are sometimes obtained that measure three and four feet in diameter.

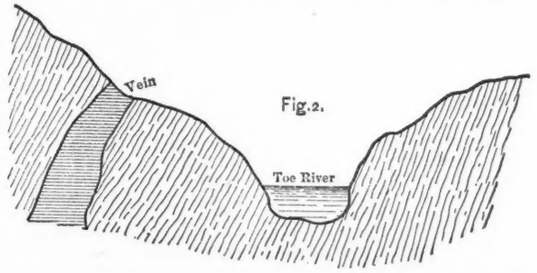


Fig. 2.

There are many peculiarities about these veins. Among the most important, in a practical sense, is the arrangement of the different constituents of the vein *inter se*. Sometimes the mica, for example, will be found hugging the hanging-wall; sometimes it is found against both walls; again it may be distributed pretty equally through the whole mass of the vein; sometimes, again, it will be found collected in the middle of the vein; in other cases, where the vein varies in thickness along its course, the mica will be found in bunches in the ampullations or bellies of the vein; in still other cases, where the vein has many vertical embranchments, the mica will be found accumulated in nests along the upper faces of these processes or offshoots. These features of structure will be best understood from a few representative diagrams.

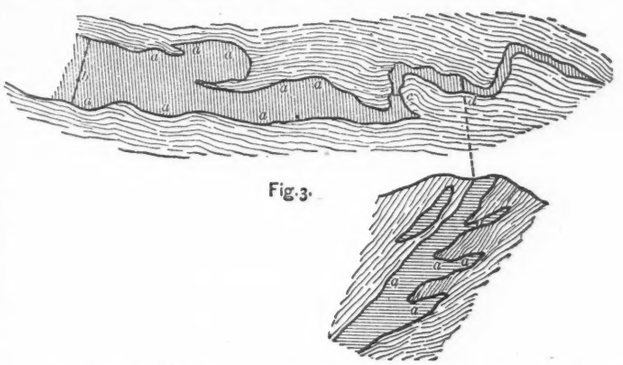


Fig. 3.

Figure 1 is a horizontal section, with several transverse vertical sections, of a typical vein in Yancey County, at the Presnel mine. The length of the section, that is, of the portion of the vein that has been stripped, is 125 feet; the thickness varies from 3 to 10 feet, except at a few points, as *b*, *c*, where it is nearly 20 feet.

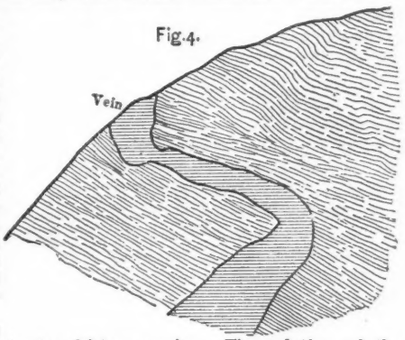


Fig. 4.

The crystals of mica are found in this mine generally near the foot-wall, in the recesses or pouches; at *c*, however, as seen in section *D*, it is found next the hanging-wall.

The inclosing rock in this case is a hard, gray slaty to schistose gneiss. The relation of the vein to the topography is seen in figure 2.

Another characteristic vein is well exposed at the Point Pezzle mine, in the same county, which has been wrought very successfully for several years. (Fig. 3.)

The inclosing rock is the same as in the former case. The mica here is found mostly next the hanging-wall, and also in the offshoots or branches of the vein, as shown in the vertical section at *d*. This vein illustrates the exceeding irregularities which are often found in these intrusive masses—irregularities in form, size, and position—and the force with which the inclosing rocks have been crowded and bent and split in the effort of the vein-matter to insert itself. This vein is 40 feet thick at *b*, and 1 to 2 feet at *c*.

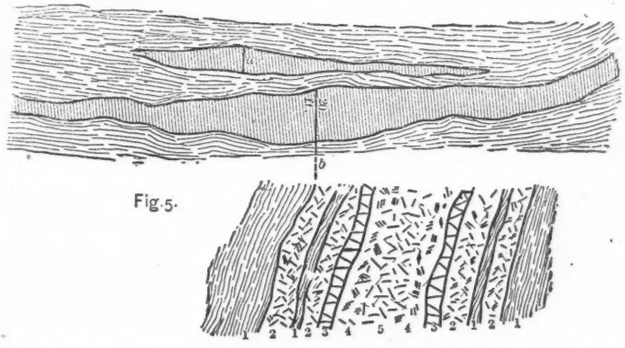


Fig. 5.

Figure 4 furnishes another illustration of the same points.

Another class of veins is represented by the accompanying cross-section of one of the largest and most productive veins, on which was opened the first mica mine in this region (Sink Hole), in the bottom of an old pit, partly filled up and overgrown, bottom and top, with heavy forest-trees of the age of three hundred to four hundred years. (Fig. 5.)

The lower part of the diagram represents an enlarged cross-section of the vein at *b*. The wall-rock, 1, 1, is a soft, decomposed mica schist. A horse of this wall-rock is imbedded in the body of the vein on both sides, 1, 1. At 3, 3, occur interpolations of smoky quartz, and next to this, on

* A paper read at the New York Meeting of the American Institute of Mining Engineers, February, 1880. From the Transactions of the Institute.

both sides, at 4, 4, most of the best mica is found, although occasiona masses of marketable mineral are found throughout the vein, at 5, and 2, 2. In the side-vein, however (*a*), the mica is found mainly in the middle.

The extent and value of the mica industry may be indicated by some statistics of this single mine. The vein has been worked out to water-level for nearly half a mile, and it is estimated that the aggregate length of its tunnels is more than six miles, and the yield of marketable mica above 40,000 pounds.

In Fig. 6 is shown a section of the Balsam Gap mine, Buncombe County. This mine is far up on the Black Mountain, at an elevation of 3500 feet, the Black rising steeply above it on one side and the Craggy on the other, to a hight of 3000 feet. The rock here is the same gray, slaty gneiss already familiar to us in the other mica mines; but, one hundred feet lower, the gneiss is massive, unbedded, and contorted, and it evidently offered great resistance to the intrusion of the vein, so that its force seems to have been exhausted in this direction, and it came to a sudden ending in breaking through the cap of slaty gneiss. The mica-bearing portion of this vein is orthoclose and albite. This mine is noted for the fine crystals of clear green beryl found in a snow-white saccharoidal quartz, and also for long, flat, bladed crystals of allanite, first found here. This mine has also yielded some fine columbites, and much black mica.

To the same class of veins belongs the famous Ray mine, near the town of Burnsville, Yancey County. This has been one of the most profitable mines, as it was also one of the earliest to come into note. Like most of the other valuable mines, it was discovered by the prehistoric excavations at various points along the outcrop of the vein, which cuts through a steep, high ridge or spur of the north end of the Black Mountain, at an elevation of 3400 feet. The portion of the vein exhibited in Fig. 7 has been excavated to the depth of from 30 to 75 feet, up the steep southern acclivity of the ridge, a distance of one hundred yards. It is a fissure-vein, of from four to thirty feet in thickness, and follows quite closely the strike and dip of the inclosing rock, which is a thick-bedded gray gneiss. The strike varies between north 10° west and north 30° to 50° east, the general dip being nearly vertical 80° to 90° west. The marketable masses of mica are found as in Figs. 1 and 3, chiefly in the curves and bellies of the vein, which is much curved and twisted, both vertically and horizontally, as shown at *B, C, D*. Two or three rods eastward of the vein and parallel to its general course, which is N. 20° E., lies a huge straight granite dike of coarse texture and light gray color, but having no apparent connection with the mica vein. Such dikes are of common occurrence in this region, and are sometimes 100 yards in thickness, and may be traced for miles. It would be very interesting to study their relations to the mica-bearing veins; relations which are nowhere apparent, so far as my observation goes. The gray gneiss, thick-bedded and commonly coarse in texture, which constitutes the country-rock of a large part of the Black Mountains, is characterized by an abundance of scattered, coarse, bladed crystals of a light-colored cyanite.

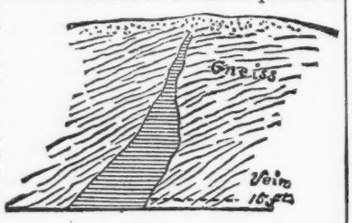


Fig. 6.

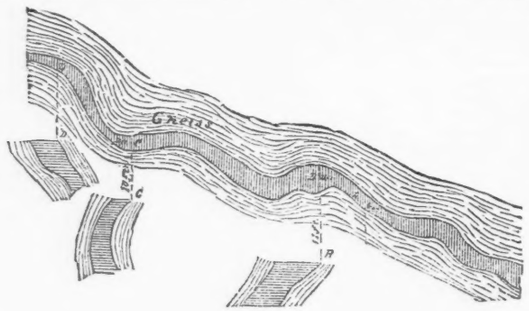


Fig. 7.

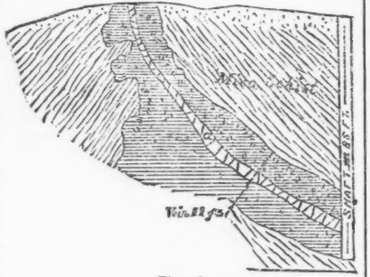


Fig. 8.

This mine has yielded many interesting minerals, as beryls, garnets, fluorite, apatite, capillary tourmaline, zircon, rutile, yttrocerite, columbite, æschimite, monazite, amazon stone, etc.

The famous Clarissa (Buchanan) mine, near Bakersville, is of a very similar description to the preceding. The product of this mine to date is 100,000 pounds, or one third of the entire yield of all the mines in the State, amounting latterly to nearly a ton per month. This was also the most extensively wrought by the mound-builders of old, who left an excavation on the vein which measured 30 feet in depth and 150 feet by 50 in horizontal extent, when reopened ten years ago. Among the rare minerals found here are gummite, yttrogummite, beryl, allanite, phosphuranylite, etc.

Fig. 8 represents a mine at the foot of Mitchell's peak of the Black, on the north side, near South Joe River, called the Westall mine. The inclosing rock is a gray, thin-bedded gneiss and mica schist, which has been much displaced by the intrusion of the vein, and thrown into opposite dips near the surface. The middle of the vein is occupied by a solid sheet of vitreous yellow quartz (*a*), 2 to 4 feet thick. The mica lies mostly against the hanging-wall and between that and the quartz, although the rest of the vein is not barren.

In preparing the blocks of mica, splitting and cutting to the forms and sizes demanded by the markets, there is a waste of from nine tenths to nineteen twentieths, even in a good mine.

The feldspar, which constitutes the larger part of the mass of these veins, is often found converted into beds of the finest kaolin; and, curiously enough, this was one of the first and most valuable exports to England in the early part of the seventeenth century, "packed" by the Indians out of the Unaka (Smoky) Mountains, and sold under the name "unakeh" (white). This kaolin, like the mica, will doubtless soon come again into demand, after lying forgotten for generations.

These are only a few of the more prominent characteristics of these very interesting veins. I have not referred to their singular richness in rare minerals, as samarskite, uraninite, gummite, allanite, etc., nor to many curious and unexplained relations between the marketable character of the mica—size, color, purity, fissility, etc.—and the special matrix in which the blocks are imbedded. I do not know a better region for the study of the structure and origin of veins in general.

GOLD AND IRON MINING IN ONTARIO, CANADA.

MR. AUSTIN GALLAGHER, who has but recently returned from Ontario, reports considerable activity in the Marmora gold-fields. The Canada Consolidated Gold Mining Company, of New York, is making considerable improvements. He reported the "deep shaft" as being, on the 14th inst., 162 feet deep, while the first level was driven 70 feet and the second level 115 feet, all in ore and with a good strong vein at all faces. In fact, the mine never looked better, in his estimation, than at that time. A substantial dam has been built across the Moira River, which will furnish power during the greater portion of the year. Men were at work clearing the way for a large flume to be conducted to the mill, which will be located about twelve or fifteen hundred feet distant. The mill-site has been cleared, and stone for the foundations was piled upon the ground waiting the coming out of the frost to be put in place. The main timbers for the proposed mill were cut and framed ready for erection. Cedar posts for the trestle between the main shaft and the mill were cut and distributed. A large portion of the bricks necessary for the roasting-furnaces were upon the ground. Telegraph poles have been cut and distributed between the mines and Marmora, a distance of about four miles, and wires and instruments will be furnished by the Montreal Telegraph Company shortly. The company had on hand nearly a year's supply of fuel, or about 1200 cords of wood. The superintendent expected to be able to put in 200 or 300 cords more before the breaking up of the roads. Permanent shaft-houses for the Tuttle and "deep shaft" were framed and ready for erection. A temporary shaft-house, to be used in sinking, was nearly completed over the Tuttle shaft. A new pump and hoisting-engine were at the mouth of the "deep shaft" waiting a boiler, the one previously purchased to drive them having exploded in testing at the shops. Work is progressing in both levels of the "deep shaft," and as soon as the air-compressors which have been ordered arrive, sinking will be resumed. The severity of the winter has hindered progress to a considerable extent, but all the indications point to great activity from this time on.

Messrs. D. K. Stewart & Co. have opened, to a depth of 35 feet, a mine on Lot 18 of the Eleventh Concession of Marmora. The vein is said to be 4½ feet of sulphurets, assaying from $10 to $83. Sinking is going on. The same parties have bought the Gladstone, adjoining the Feigel on Lot 17 in the Eleventh Concession. They are working ten men, and have two shafts 45 feet deep. The vein is irregular, and carries from $4 to $60 of gold. A mill will be running on this ore very soon.

The Feigel mine, lately purchased by Messrs. Beatty & Kelso, will be running soon.

The Craig mine, in Tudor, has been working a 4-foot vein, hauling the ore five miles to the Bannockburn mill, and getting about $8 per ton, free gold. The famous Richardson mine, it is said, is likely to be worked again next summer.

The prospects for the iron mines at Madoc are fairly encouraging. The ores from this district are selling at from $3 to $5 per ton on the cars, according to percentage of iron contained. It is thought that the production from these mines will aggregate from 100,000 to 150,000 tons during this year. The cost of mining is estimated at about $1.50 per ton, the freights to Black Rock $1.90, and the United States duties, fees, etc., about fifty-seven cents; so that with incidentals the cost at Black Rock, duties paid, will range between $4 and $4.25 upon a large business. The following mines are being operated, or likely to be, during this year: Hematite, Seymour, Sexsmith, Dufferin, Hobson, Nihil, Brooks, Nelson, and the Blairton.

PENNSYLVANIA STATE GEOLOGICAL SURVEY.—Accompanying the Pennsylvania State Geologist's report for last year, which has just appeared, is a "map of progress," showing in its civil divisions the location of all the new townships, some 243 in number. It has plainly marked all the lines of railroads, of which there are 1700 miles, all the main roads in the State, and all the places where meteorological observations have been taken. The numerous iron and zinc mines are also indicated.

NEW JERSEY STATE GEOLOGICAL SURVEY.—The annual report for 1880 of the State Geologist of New Jersey, recently published, gives in detail the results of the last geological survey of the State. Considerable attention has been given to paleontology, and specimens of fossil fish and plants of the cretaceous, tertiary and post-tertiary ages have been collected. The production of iron ore is estimated at 840,000 tons, an increase of 350,000 tons above the product of 1879, and of 175,000 tons above that of 1873. The native fire-clays are reported to surpass those from the other States and from European countries. Silver has been found in the red sandstone region to the extent of three ounces and upward to the ton. The percentage of copper is equally low, and no gold has been found in any of the assayed ore and specimens.

COPPER SMELTING—ITS HISTORY AND PROCESSES.

By Henry Hussey Vivian, M.P.

The President of the Royal Institution for the present year, H. H. Vivian, Esq., M.P., delivered the last of the pre-Christmas course of lectures in the theater of the Institution, at Swansea, South Wales, on Monday evening, December 20th, 1880, before a large and attentive audience. Mr. Vivian said:

I shall endeavor in the lecture I am about to give on Copper Smelting to avoid on the one hand mere scientific and, on the other, mere technical details. My aim will be to tell you as simply and concisely as I can, the story of Copper Smelting as I understand it; to import into it some of the experiences of the thirty-seven years during which I have been actively engaged in it; and in doing so, I hope that I may succeed in giving a few grains of useful information, both positive and negative; that is, both what to do and what not to attempt. Smelting is a "dry" process necessarily, and although it has much "fire" in it, I fear I can impart none to my tale to-night. Now it must occur to any one, I think, in considering this question, to ask in the first instance how and when Copper Smelting began. I am not aware that a perfectly satisfactory reply can be given to that question. The only authentic history we possess of very early times is the Bible; in it we find constant mention of brass, while the word "copper" occurs only once in the Old Testament, namely, in the 8th Ezra, 27th verse, where it is stated that "two vessels of fine copper, precious as gold, were offered with gold and silver vessels to the house of God;" but even in that case the annotation in the margin is, instead of "fine copper," "yellow or shining brass." It seems, therefore, uncertain whether, even in this solitary instance, "fine copper" was used. There is, indeed, grave reason to doubt whether pure copper was used in very early ages, either in Europe or Asia. On the other hand, brass, or rather bronze, was in common use, although the above extract, dating only 457 years B.C., seems to assign to it a very high value. I say bronze and not brass, because the alloy was copper and tin, which is, properly, "bronze," while "brass" is an alloy of copper and zinc. What we now call brass was produced by heating metallic copper and a mineral called "Lapis Calaminaris" together with charcoal in a crucible whereby the carbonic acid was driven off, and the zinc contained in the "Lapis Calaminaris" was reduced to metallic zinc, and thus alloyed with the copper. It seems also probable, from the evidence produced by Doctor Percy, in his valuable work on zinc, that the furnace deposits produced in smelting zinciferous copper ores were used to produce brass by heating them with metallic copper precisely as in the case of Lapis Calaminaris. The metal thus produced was called "Orichalcum" by the Romans, in contradistinction to "Æs," which, although often ignorantly translated brass, was really bronze, that is, copper and tin with occasionally some lead—9 to 1. "Orichalcum" seems to have been well known at the commencement of the Christian era; but I can find no evidence of its earlier use, and I think we may assume that when "brass" is spoken of in the Bible, an alloy of copper and tin, not copper and zinc, is meant. There is scarcely a book in the Old Testament in which the word brass does not occur; in fact, it is mentioned 38 times in the Pentateuch, excluding Deuteronomy. Beginning in Genesis, we find, in the 22d verse of the 4th chapter, that "Zillah bare Tubal Cain (the seventh in descent from Adam), he was an instructor of every artificer in brass and iron." The date assigned to this chapter is 3875 years before Christ. In the book of Exodus, there are ten separate cases in which brass is mentioned. The first is in the 25th chapter and 3d verse, where God directs Moses to instruct the children of Israel to bring "offerings of gold, and silver, and brass for the purpose of constructing the 'Sanctuary,' the supports and vessels of which were to be of brass;" the date assigned to this is 1491 B.C. It would occupy too much of my time to attempt to go through the numerous instances in which brass is mentioned in the Old Testament; but I will first ask one moment to draw attention to the extent to which brass entered into the construction of the Temple of Solomon, B.C. 1005. We are told that King Solomon sent to Tyre for a man called Hiram, a worker in brass, "who was filled with wisdom and understanding, cunning to work all works in brass;" he cast two pillars, each 18 cubits high, or 32·832 feet high, nearly 33 feet—and 12 cubits or 21 feet in circumference, say 7 feet in diameter. He then cast a chapiter or capitol for each, 5 cubits or 9 feet high. Then follows a detailed description of the brass work with which he ornamented these pillars, which stood on each side of the porch. He also made a molten sea of brass 18 feet in diameter, and twelve oxen of brass to support it. He made various other large bronze castings, richly ornamented and engraved with lions, oxen, and cherubim. Twenty-five verses are devoted to the description of Hiram's works in brass. We may deduce from this passage that the casting of bronze had attained great perfection nearly 3000 years ago; in fact, it would be a considerable work, even at the present moment, to cast bronze pillars 33 feet high and 21 feet in circumference, or a bronze basin 18 feet in diameter. To make such a casting, a large quantity of metal would have to be melted at once, not probably in crucibles, but in a cupola or reverberatory furnace, and great skill would be required in manipulating so heavy a casting. It is also clear that the art of molding was well understood. From whence did the copper and tin come, and who smelted it?

If we turn from the inspired history of the Bible to those records of past ages which are stored up in the barrows, lakes, refuse heaps, and battle-fields of Europe, we find equally clear and indisputable evidence of the great antiquity of copper, not, indeed, as copper in its pure state, but as bronze. There seems no reason to doubt that bronze was the first metal used by man for the construction of implements and weapons. As a metallurgist, I should have certainly said, *à priori*, that iron, from the abundance of its ores, occurring, as I think I am safe in asserting that they do, in every known geological formation, and from the ease with which rich ores of iron can be reduced to metallic iron, ought to have been the first to attract the attention of man; but I am bound to say, that the evidence adduced by my friend, Sir John Lubbock, in his admirable work on Pre-Historic Times, and by others, appears to me to leave no doubt that an age of Bronze succeeded the Stone age, and preceded the Iron age. I think I am right in saying that no attempt has been made to fix any thing like an approximate date to the commencement of the Bronze age; but Sir John Lubbock appears to be of opinion that the transition from bronze to iron took place about 900 years B.C. This would be nearly 2800 years ago, and through what a long vista must we look back before we see the commencement of the age of bronze in Europe!

But did it commence in Europe? The best authorities say "No," and I think they establish their case. It is almost certain that the use of bronze was introduced from the East, either as a branch of commerce, or, as seems more probable, by the incursion of a powerful and warlike race, large in stature and better armed than the men of the Stone age, who were consequently speedily extirpated by them. This inference is drawn from the bones found in Bronze age tumuli. Professor Rolleston tells us that "Hesiod (who is supposed to have written about 900 years B.C.), in his *Works and Days*, had somehow become as much impressed with the vast size and brute strength of the bronze-using people as I have become from actual handling of the bones." He also says, "All this seems to me to point to a conquest of this country having been effected by bronze-using invaders, who came in great numbers, probably, as has been elsewhere suggested, from the Cimbric peninsula." The relics of this race prove that they were a people of higher civilization than the men of the Stone age. During this age, true bronze alone is found; that is to say, an alloy of copper and tin; during the Roman period, lead was frequently introduced into the alloy, but during the same period bronze was not used for the manufacture of weapons or cutting implements; iron and steel had taken the place of bronze in the manufacture of swords, spearheads, and the like.

It now becomes an interesting question to consider, whether, during the Bronze age, the materials of which it was made were produced in Europe or imported into it? Sir John Lubbock says: "The impurities in the bronze indicate that the copper ore was not all derived from one locality, and lastly, the discovery of molds in Ireland, Scotland, England, Switzerland, Denmark, and elsewhere, proves that the art of casting in bronze was known and practiced in many countries. Under these circumstances, it appears most probable that the knowledge of metal is one of those great discoveries which Europe owes to the East, and that the use of copper was not introduced into our continent until it had been observed that, by the addition of a small quantity of tin, it was rendered harder and more valuable." It seems almost certain that Europe, at least, never passed through a copper age. Implements of pure copper are extremely rare; a few have been found in Ireland. Some of these are of doubtful composition, and one is supposed to have come from America, where, undoubtedly, an age of copper did exist. That, however, is explained by the massive deposits of pure copper which occur on the shores of Lake Superior, which bear evidence of extensive and very early working. The remarkable similarity of bronze implements, wherever found, is an additional proof of their early importation, and that they came from a common center of manufacture, although the existence of molds in various countries, as before mentioned, shows that the implements were also cast in those countries, probably to meet the special tastes of the persons who were rich enough to buy them; the manufacture was probably carried on by re-casting bronze ingots brought from their distant source of production. This seems strange and contradictory in view of the existence of copper and tin in such abundance in Cornwall; but we have the distinct evidence of Cæsar that even in his day these islands imported their bronze, in the often quoted words, "*Ære utuntur importato.*" Further, I am not aware that there is any record or remains of very early copper smelting in Cornwall, or elsewhere in England. I do not speak of Roman days; for I believe there is some slight evidence of copper smelting in the North of England in Roman times; but I speak of the times of the true Bronze age—the men of the "Round," "Bell," "Bowl," and "Cone" shaped barrows in which bronze, and not iron, is found.

It is indeed a most interesting question, Whence came the bronze? Whether in the shape of celt, sword, spear, brooch, or ingot, which supplied those men with their weapons and ornaments? So far as I am able to form an opinion from the works I have read, I believe that it came from the East, and I agree with Professor Rolleston in the opinion he expresses in that most able paper which he read before the Bristol and Gloucestershire Archæological Society, "On the Three Periods known as the Iron, the Bronze, and the Stone Ages," from which I am largely quoting, and to which I owe many thanks. Professor Rolleston says: "Where was likely to be made the discovery of the advantages to be gained from alloying copper with tin, and so obtaining bronze? It was, of course, likely to be made in some district in which the ores of these two metals were to be found in proximity." When I say I agree in that, I must guard myself against being supposed in any way to assent to the theory enunciated by M. Wibel, that bronze was obtained by the direct fusion of an ore containing tin and copper. I will not detain you by any argument in disproof of what I regard as so absurd an idea; but I do believe that we must look to a district producing ores both of tin and copper as the most likely source of the discovery of bronze. Cornwall is such a district. But I have already stated my reasons for believing that Cornwall was not the primary source from which the bronze of very early ages was derived. No doubt exists that the Phœnicians, who were the great traders in tin between 1500 and 1200 years B.C., visited Cornwall, and purchased its tin, which they carried to the Mediterranean, and possibly also to Northern Europe; but I never heard that there was any reason to suppose that copper formed part of their commerce with Cornwall, nor indeed, as I said before, that copper was produced there in very early days. I think our friend, Professor Rolleston, who gave us so much pleasure and information at the meeting of the British Association here this year, has probably hit upon the most probable source of the early production of bronze, which he details at some length in the 7th, 8th, and 9th pages of the paper I before referred to. He first shortly discusses Cornwall, and then turns to "Khorassan;" he tells us that Strabo, who flourished at the commencement of the Christian era, and in recent time Burnes, hinted at the existence of tin in that district, and he tells us that "the late illustrious Von Baer, but twelve days before his death, in 1876, published full and authentic information upon this subject in the *Archiven für Anthropologie*, derived from a report procured by the Vice-President of the Imperial Geographical Society of St. Petersburg, Herr Semenow, as to the existence of tin, copper, and other minerals near Merv, Herat, and the Banyan Pass. This report, which the professor quotes, seems to establish

the existence of rich lodes of tin and copper in that district, and they also state as a fact that many utensils of pure tin are made by the natives for household purposes. Herr Von Baer remarks: "This information makes it highly probable that the tin which enters into the composition of the many bronzes which have been found in Assyrian and Babylonian ruins came from the neighborhood of Khorassan." Professor Rolleston then goes on to mention a third locality as another and, I think, even more probable source of early bronze, namely, the region lying between Birmah and Banca. He quotes a passage from M. Mortillet, in the *Revue d'Anthropologie*, in 1875, in which he says that "it is evidently there that the origin of bronze must be sought," and he points out the abundance in which tin occurs in the peninsula of Malacca and the island of Banca, together with the copper production of the Archipelago. The Japanese and Chinese both produce copper and cast largely in bronze, even to this day. When and how in the long vista of their history did these arts begin? We know that they regard our era of 1900 years, or that of Rome preceding it by 750 years, as things of yesterday; and we know that advanced civilization had existed among them long ages before Grecian and Roman nations had any existence. Dr. Percy tells us that a book is extant, written in Chinese and Japanese, which gives a most detailed description of copper smelting in Japan, and is illustrated with not less than 100 drawings, showing the perfection to which they had carried that process in early days. The date of the book is unfortunately not given. From the translation quoted, it appears that they go through almost precisely the same processes that we and all other copper smelters of the world go through—that is, roasting and melting the ore, roasting and melting the regulus, blowing it into copper, and refining. But perhaps even more remarkable than this process arrived at and described by the enlightened Japanese long ago, is an extract given by Dr. Percy, from an account of Hindoo Copper Smelting, written by Mr. H. F. Blanford, of the Geological Survey of India (page 387). He says: "I witnessed the process, here described, in one of the southern valleys of Sikkim Himalayas, a few miles from the Terrai. The workmen were Nepaulese, by one of whom the little mine was rented from the government." Mr. Blanford then describes the dressing of the ore, namely, pure copper pyrites, which was effected almost precisely as the same operation is performed in Cornwall, and, indeed, in Europe generally, namely, first, a separation of the best from the worst by hand; then, after reducing the ore to a fine state, by washing in a "tye" with water, precisely as in Cornwall and elsewhere. The ore thus "dressed" is melted in a low hearth, the front wall only about six inches high, and the sides about one foot above the furnace-bed. The fuel is charcoal, and the blast is produced by bellows, made of a seamless bag of goat-skin, attached to a nozzle like a blow-pipe, made of clay; these rude bellows were placed one on each side of the hearth, and worked by a boy who alternately loosened and tightened his grasp as he raised and lowered the bellows. The nozzle was inclined downward to within three or four inches of the furnace-bottom. Dr. Percy then proceeds to give extracts from an account published at Calcutta in 1831, of the process of copper smelting carried on at Singhana in India, which appears to be almost absolutely identical with that described by Mr. Blanford in the Sikkim Himalayas, the only difference being that the ore was first mixed with cow-dung, formed into lumps, and burnt for twelve hours in heaps; this roasted ore was then melted at once into coarse copper, which, if the burning had been well done, would naturally be produced, probably with some regulus, which may have been overlooked by the person who wrote the account. The copper was then refined in a small vessel which received the blast of a single bellows. The notice ends with these words: "Copper smelting must have been carried on in this locality during a very long period, as the slags had accumulated to such an extent as to form a line of small hills several hundred feet in length and 30 to 60 feet in hight. There were four isolated stone bastions built on one of these artificial mounds."

I have ventured to trouble you at length with these accounts of copper smelting in the East, because, as I before stated, I think there is good ground for believing that the production of copper began there in the remotest times, and I think it is most interesting to show that the natives, although utterly ignorant of scientific metallurgy, yet nevertheless smelt ores of copper and produce that metal on precisely the same principles which prevail to this day in the most scientifically conducted works of Europe. I do not mean to assert that material differences in the appliances used do not exist; but I do assert that the principles involved in their practice and of European copper smelters are identically the same. I have no doubt in my own mind that the systems adopted at the present moment by the Hindoo, Mussulman, Japanese, and Chinese smelters, in those far regions of the East, are precisely the same as those which their forefathers used in the remotest times. I have no doubt that the copper which went to produce the bronze with which Solomon's temple was adorned nearly three thousand years ago was smelted in the same way as that now practiced in the East, and that we may probably go back another three thousand years, to the days of Zillah's son Tubal Cain, and still with truth make the same assertion as to the process of copper smelting.

I have now dealt with the very early days of copper, the Bronze age proper, and that which preceded it. Let us now come to Roman times. We know that Æs, that is, bronze, copper alloyed for the most part, with tin, was very extensively used. We know that almost every sort of utensil was sometimes made of bronze. I doubt very much whether copper, as a pure metal, was largely used even by the Romans. I have seen thousands of Roman bronze castings, but I can not call to mind having seen one of pure copper. The reason is self-evident. All those objects of common use were cast; pure copper will neither cast sound nor fulfill the requisite conditions of hardness without being rolled or hammered; it is soft, malleable, ductile, but not hard and resistant. I think it also probable that the condition in which it left a Roman refinery, that is, like the German or Russian rosette copper, caused it to be specially unfit to be hammered, as it would be in what we call an "overpoled," and therefore not tough condition, and also very porous. Be that as it may, the fact remains that copper, as bronze, was extensively used by the Romans, and therefore that copper smelting existed at that period on a large scale. Whence did the copper come? We all know the fable that copper first came from the last but, I fear, not the brightest diamond in the British crown, the Island of Cyprus, and that it even derived its name from that island; but is it not more probable that the island derived its name from the metal? for language began with man, and we can hardly doubt that copper existed in the far East long before the Island of Cyprus received the advancing wave of Eastern civilization, bringing with it probably the name and knowledge of copper. We know as yet nothing of the copper mines of Cyprus; but we know a great deal too much of the ancient copper mines of Spain. Last year, I visited the famous Rio Tinto and Tharsis mines, and found them covered with mountains of old slags, just as the often prophesied New Zealander may some day wander over and wonder at our Swansea slag-heaps. There is good reason to believe that these workings were Roman, and no one, looking at those heaps, can doubt the great scale upon which they worked, and the skill with which their operations both below and above ground were conducted. They rejected and left unworked the low-produced pyrites, but they followed eagerly the rich veins of yellow ore which traverse those mighty deposits. I saw the wonderful northern "face" of the great "Open Cast" at Rio Tinto, compact pyrites some 80 or 100 feet deep and 1000 feet long, pierced at frequent intervals by ancient Roman galleries, following with true mining instinct the veins of rich ore. I examined critically the slag-heaps, and was astonished at the freedom of the slags, made perhaps nearly 2000 years ago, from prills. At this moment, with all my accumulated experience of copper smelting, I don't know how they made those heavy irony slags so clean. I had but little time to examine the ground, and I failed to find the remains of their furnaces. I failed also to find metallic bottoms, the famous "Eisensamen," or "iron pigs," which almost invariably accumulate in the bottom of blast-furnaces, working on ores of this nature, and which do now occur largely in the most scientifically conducted works of Germany and Sweden. Surely these "old men" knew their business! The only conclusion I could draw from what I saw at Rio Tinto was, that they must have had numerous small furnaces similar to those Eastern furnaces I have been describing, contiguous to the shafts or levels from whence the ores were raised, because the slags cover the deposit for acres in extent, and show no signs of having been driven from any one central spot, so far, that is, as my very limited means of observation went. I conclude that they must have used very low blast-furnaces, somewhat like the "Castilian furnace" of the present day, or possibly like the "Scotch hearth" of Northumberland, which is still extensively used for smelting lead ore, and which is little more than an ordinary blacksmith's hearth; such a furnace would probably be less likely than any other form of blast-furnace to produce "Eisensamen," or "metallic pigs." It is also probable that they roasted the ore and regulus in heaps, because the Spaniards do so at the present day, and have done so from time immemorial, for the purpose of rendering a portion of the copper soluble, and thus obtaining it by lixiviation and subsequent precipitation by iron. It is by this process that the present great copper production of Rio Tinto, Tharsis, and Mason & Co. is effected; but in Roman times, it is plain that the rich ores alone were worked, and that the copper was obtained by smelting; otherwise, the enormous masses of slags which we see could have had no existence. I am confirmed in this belief as to Roman copper smelting by the process adopted at the Ocker Hütte, in the Hartz Mountains, where ore of a very similar character to Spanish pyrites is produced from the great Rammelsberg mine, which is said to have been continuously worked from times quite as remote as the Roman era. That ore is a pyrite rich in iron and sulphur, but poor in copper. It is, or was up to a recent date, burnt in heaps, and then smelted in low blast furnaces, so low that the ore is charged from the floor of the works, no stage being used, as is usually the case in blast-furnaces: the resulting regulus is, or was, burnt again and again in heaps, and again and again melted in low furnaces. I believe little or no change took place in the process of copper smelting at the Ocker Hütte from the remotest times up to the date of which I am speaking, some thirty-five years ago, and that we have there a relic of the practice of those bygone ages; by no means a bad one for the class of ores and fuel they had to deal with.

No doubt the Romans obtained their supplies of copper from various sources besides Spain. There appears to be little evidence as to the working of copper mines by the Romans in England. Dr. Percy, however, quotes M. Albert Way and Mr. Franks, two eminent archæologists, as having informed him that lumps of metallic copper, more or less rounded, have been discovered in different parts of the country, but always in association with articles of bronze. He examined one of these, and found it to be practically pure copper. He also says that Pennant describes a cake of copper found at Caerhun, or Caer-hên, the ancient "Conovium," near Conway; it weighed 42 pounds, and resembled a cake of beeswax; the diameter at the widest part was 11 inches, and the thickness 2¾ inches. On the upper surface was a deep concave impression, with the words "Socio Romæ," and across them the word "Natsol." This would seem to indicate that a Roman co-partnership existed, and that the partners received their dividends in kind. Dr. Percy supposes that the copper came from ores raised at Llandudno, which were smelted *in situ*. This, I believe, is almost a solitary instance of Roman copper in England, although they had abundance of bronze; but whether imported or produced here, we know not.

(TO BE CONTINUED.)

THE LABOR QUESTION.

Special Correspondence of the Engineering and Mining Journal.

Interesting signs of the times are the reports which come from the Stormont, Utah, and now from the Comstock District, in Nevada, regarding the determination of mine-managers to reduce the wages of employés to something like a business basis. Already the subject is being agitated in Leadville, and a few of the newer districts are taking courage and renewed hope from the example of experienced management in these sections.

In the columns of the JOURNAL, and in other places, I have diligently advocated for a long time a plan of action similar to that very wisely pursued by Manager Allen in refusing to pay the exorbitant rates demanded by miners at Silver Reef. Amateur mining has paid large returns upon investments in many lucky instances; but there can be no

question that a very much larger number of mining companies would now pay dividends if all were managed by engineers competent to decide when and where and at what price to apply manual labor to their work. The great San Juan region, in Southwestern Colorado, where nature has done more for man than in any other part of the world, in the amount and value of mineral wealth displayed, has far less fame to-day than it really deserves as a field for the safe investment of capital, not because of the fraudulent schemes emanating from that country, but almost wholly on account of the excessive cost of development, which has hitherto rendered mining unduly expensive and too little remunerative. The same complaint comes from other sections, and thus the idea prevails among investors that the greatest returns are to be anticipated from mines which carry only the highest grades of ore. The real fact is, that large, even bodies of low-grade ore, with liberal investments, are generally more remunerative than the phenomenal deposits of excessively rich ores, from which too much is expected in the capitalization of the company that works them.

The adjustment of the price to be paid for labor would come more surely and quickly, if it were thought necessary to place the management of mines in the hands of skilled engineers, practically trained for their work, and capable of economically employing the funds at their disposal.

But there is another phase of the labor question that seriously concerns all who are directly engaged in mining—the employé as well as the employer. There are numerous instances in every mining district of success and failure under almost identical circumstances, one item alone unconsidered. A trained workman, or one properly guided, will often perform more productive work in an hour than an unskilled laborer can accomplish in a day, and with much less muscular expenditure. Many who are placed in charge of mining work are incapable of judging of the most direct means of accomplishing the development of their properties; hence the price of labor in many districts is regulated very much as it would be in any ordinary instance where the element of skill is not to be considered. This is the chief reason for the favor which the contract system retains in many localities; for this throws the responsibility for waste and lack of skill upon the laborer himself. At least, this should be the result, as it is the purpose, of this method. That it often fails of accomplishing all that is desired, is due to the low average of skill of the laborers in many of the newer districts; for the greater the ease with which the workman can perform a given amount of available work, the more he can do in a given time, and the less he will expect for each hour of such service.

To the careless observer, the whole solution of the labor problem hinges upon the price per day paid to the miner; but to one in charge of the work, it assumes a very different aspect. The mine-manager well knows that three or four dollars per day paid to one good miner will often produce twice as much money value as when several common laborers are employed at a much lower price. This principle is fully recognized in the compensation of foremen, who receive usually very high wages; and wherever an attempt has been made to pay under-workers according to their real merits, results have been reached in every way most satisfactory to employer and employed.

The contract system has thus far been about the only plan practically adopted to accomplish this end; but this method is also defective in so far as it acts as a mere transfer of risk from the manager to the chief contractor or contractors, who commonly hire their work done by the day, and really effect less saving than could be made by the manager himself, by the aid of skillful overseers. Hence, in very many cases, the contract serves merely to divide the manager's personal risk, and is a real godsend to those in charge of mining work, who are incompetent to personally conduct it.

However, in developed mines, where numerous drifts, shafts, and stopes give a clear understanding of the nature of the work, it may be economical of both labor and time to let small contracts to two or three actual laborers at each point of attack, thus retaining all the advantages of the system to both parties in interest, without the disadvantages previously stated.

So much for the manager's relations to the question. There is a matter that seriously affects the pockets of the stockholder, outside of all these considerations. I refer to the great need of better training of all who are connected with mining work, from manager to the least important employé. Our dividend-paying mines are nearly all in the hands of well-trained engineers, who know the necessity of keeping reserves of ore and money laid up against the day of enforced dead-work, and such men as these are only occasionally the sons or near relatives of the presidents of the companies they represent. We need the resignations of a vast number of incompetent managers, and the substitution of thoroughly qualified mining engineers, who will not be expected to assist in the manipulation of the Eastern stock markets. We also need more skilled miners, who can handle, understandingly and with full effect, the tools and machinery necessary in their work. The mining industry will only thrive when abundant working force of this character is supplied; for the great problem of the future will be, not where to find new deposits of rich ores, but how to work low-grade ores economically. THEODORE B. COMSTOCK.

61 BROADWAY, NEW YORK, March 22.

PROGRESS IN SCIENCE AND THE ARTS.

The Barometer Guide for Explosions in Fiery Mines.—*La Houille* finds, in the most recent explosions of fire-damp, fresh confirmation of the fact that these explosions are due to an abnormal liberation of gas, and almost invariably coincide with a marked lowering of barometrical pressure. The equilibrium ordinarily existing between the atmospheric pressure and the pressure of the gas in the mine is destroyed, and the fire-damp forms an explosive mixture with the air, which is not sufficient in quantity and purity to dilute the fire-damp. To supply more air under these circumstances, the ventilator must work with greater rapidity; and to keep himself informed of the pressure of the atmosphere, the engineman must have such a barometric guide as will accurately indicate the degree of speed necessary for the ventilator. The *Barométre Guide*, our contemporary affirms, completely meets the necessities of the case. This instrument is simply an aneroid barometer, whose limb indicating the atmospheric pressure is surrounded by another limb, graduated according to rules given by the inventors, and on which are inscribed figures corresponding to the speed to be given to the ventilator for which the instrument is graduated. The needle, by its position in these figures, indicates immediately, at any time, the number of revolutions to be given to the ventilator, so that the temperature of the mine may be exactly under control. The inventors are M. Harmant, director of the Réunion Colliery at Mont-sur-Marchienne, and M. Loppens, a manufacturer of electrical apparatus at Gosselies, Belgium.

Compressed Air Locomotives.—We have already recorded the first trial trip made by the Beaumont compressed air engine, on the Metropolitan Railroad, London. The second recently took place under the superintendence of Mr. Tomlinson, the engineer of the line, accompanied by a party of civil engineers and other gentlemen. A carriage having been coupled on, the engine started at 12.45 A.M., from the Edgware-road Station and ran to the South Kensington Station, whence, after a brief halt of a few minutes, the engine returned with the carriage to Edgware-road, thence back to Queen's Road, Bayswater, and back once more to Edgware-road. The total distance traveled was 10½ miles, and the total weight drawn, including the engine itself (eight tons), was about 20 tons. Train time was kept throughout. The engine started with an initial pressure of 1000 pounds on the square inch, which is the maximum; and when it finally stopped, the gauge showed there was still a pressure of 400 pounds in the reservoir, so that only three fifths of the supply of air had been exhausted on the journey.

Progress in Steam Navigation.—The London *Engineer* of a late date gives a report of a lecture on recent improvements in marine navigation, by Mr. William Pearce, of Messrs. John Elder & Co., the Clyde ship-building firm. The first steamers of the Cunard Company, established in 1840, were under contract to go 8½ knots per hour, indicating 740 horse-power, and consuming $4\frac{7}{10}$ pounds of coal per horse-power. The Persia, built in 1856, had side-lever engines, indicating 3600 horse-power, and consumed $3\frac{7}{10}$ pounds of coal per horse-power. The Gallia, built in 1879, was fitted with compound engines, indicating 5000 horse-power, and with a speed of 15½ knots. The Persia was able to carry only 250 tons weight of goods, or 800 tons measurement of light goods. The Gallia carried 1700 tons weight, or 2000 tons measurement. Consequently, the Persia burnt 6⅓ tons of coal for every ton of cargo it carried, while the Gallia burnt less than half a ton, although she carried the cargo 2½ knots an hour faster. The Arizona, indicating 6000 horse-power, consumed 1¾ pounds of coal per indicated horse-power, and carried 3400 tons weight of cargo at an average speed of 16¼ knots. She thus burnt less than 4 hundredweight of coal per ton of cargo at a speed across the Atlantic faster than any yet recorded. Progress in the construction of the hull had not proceeded at the same rate.

The St. Lawrence Tunnel.—The machinery used in boring the new tunnel under the St. Lawrence River was removed from the ice on the 22d inst. Although the operations were far from complete, the engineers in charge say that the tunnel is practicable, and that they will have a slate-like rock to drill through.

GENERAL MINING NEWS.

ARIZONA.

From our Arizona exchanges we condense the following:

CONTENTMENT.—The cross-cut east on the 300 level is now in 200 feet, and a cross-cut has been entered west on this same level.

COPPER QUEEN.—Most of the work has been done in an open cut, quarrying the ore straight out, and sending it down a chute right to the ore-crusher. It has a shaft both on the west side of the deposit and from the bottom a drift south 35 feet, from which good ore is extracted. A tunnel has been run into the hill in the deposit. At 40 feet, a cave was struck branching east and west. They have drifted from this point both ways, 63 feet west, and about 60 feet east, both in good ore. A header has been run into the mountain about 100 feet, 60 feet being in ore, to a point where it dipped under. A barren streak was then met with 30 feet wide, which was cut through, and now they are 10 feet in good ore. From the east drift, they are drifting south at a point about 50 feet in from where the cave was struck. The face of the open cut first referred to contains large blotches of copper ore going very high, and the flux required for smelting it is found close at hand.

HEAD CENTER.—The miners have at length been set to work cutting out the stations and getting ready for stoping. This will take some time, and there is, consequently, nothing new to report concerning the mine.

SULPHURET.—Drifting continues on the ledge at the 500 level, which is looking splendidly. A drift on the ledge at the 350 level will connect with the Flora Morrison workings.

TOMBSTONE MINE AND MILLING COMPANY.—In the northwest shaft, in the Tough Nut, the drifts are all in ore and the faces advancing at the usual rate of progress. In the Good Enough main workings, east incline, the face has advanced 30 feet since last report, still in ore, as is also the new winze, 260 level. From this winze a cross-cut has been run 20 feet in ore-body. The new hoisting-works are nearly completed.

VIZINA.—The main shaft is 231 feet deep. The indications at the bottom are said to be very favorable. The inclines and the drifts in the upper levels are still in ore.

CALIFORNIA.

AMADOR COUNTY.

ONEIDA.—The Amador *Ledger* of the 5th inst. says: The stamps were hung up Saturday, and all hands discharged. This step has been anticipated for some time, as the operations of the company have been unprofitable for a long period. A few miners have been selected to do a little prospecting, but comparatively it may be said that the mine has closed down. Beyond all question, this is the most serious blow that has fallen upon this section for many years. The company has given employment to from 50 to 80 men, who were paid regularly every month. It is not likely that the works will be abandoned until considerable prospecting has been done.

BODIE DISTRICT.

The Bodie *Free-Press*, in its review of the mines of this district for the week ending March 12th, says: Notwithstanding the inactivity in the stock market, many of the Bodie mines made a better showing than usual during the past week, and the general outlook for the district is more encouraging than ever before. Addenda is working slowly, pending the result of litigation with the Concordia. Bodie is again coming to the front with high-grade ore, but another faulting vein has been encountered on the sixth incline level, 253 feet north of the incline

shaft, and 25 or 30 feet north of the red faulting vein encountered on the third, fourth, fifth, and sixth levels. Boston Consolidated, main shaft, is 38 feet below the 400 foot-level, is still sinking, and is yielding some fine assays from the east side at the bottom. Black Hawk is cross-cutting on the 790-foot level for both the east and west veins, and will tap both in from ten to fifteen days. Concordia is looking well, both in the north drift of the main vein and the south drift in the small vein west of it. Consolidated Pacific is making a good showing on the 500, 600, and old tunnel levels. Goodshaw is still sinking, the main shaft being now down 56 feet below the 600-foot level, with no signs of that troublesome element, water. Jupiter, in its discomfiture at losing the suit against the Bodie Consolidated, is pushing its east cross-cut No. 3, 600-foot level. Sinking was resumed in the Lent shaft last night, the bob and two tank stations having been completed, and the foundation for the heavy pumping machinery is well advanced. The shaft was sunk and timbered to a depth of 460 feet before the stations were cut. Noonday is making a fine showing in its south drifts on vein No. 1, both on the 412 and 512-foot levels, and has ample water in the 66 feet of shaft sunk below the 512 to supply the mine and mill, which cuts off a heavy expense. North Noonday is equally benefited by the home supply of water, and is also showing important improvement, not only in the No. 1 vein stopes on the 212, 312, and 412-foot levels, but also in the north drift in vein No. 2, 312-foot level. Oro is shoving its shaft down with an increased force of men, and will reach the 540-foot (Concordia and Red Cloud 400) level by the end of the current week, and will then cross-cut east 50 feet to the main Walter ledge and west 70 feet to the rich Taylor vein of the Concordia. The Red Cloud shaft is being steadily and rapidly sunk, and it is believed that it will soon drain the water so that the Noondays can resume sinking. Syndicate is still stoping and milling ore from the old upper levels of the Osceola vein. The South Bulwer shaft is 54 feet below the 550-foot level, and is steadily descending. The new shaft of the South Noonday is down 20 feet. Tioga is cross-cutting east on the 982-foot level. One hundred tons of Bodie Tunnel ore have been run through the Miners' mill, which is now being cleaned up.

BULWER CONSOLIDATED.—A letter from the superintendent, dated March 8th, says that the only work doing at present consists of upraises making from the 200-foot level with a hope of finding some good ore in the upper portion of the mine. On this level, there is an immense amount of ore exposed, and in places it is a fair quality, but generally it is rather low grade. On the 380-foot level, there is also a large amount of ore in sight, and of about the same quality as on the 200-foot level. From the 380-foot level, a winze has been sunk on the Ralston vein 100 feet deep, making a depth from the surface of 480 feet (vertical), showing low-grade ore the entire depth; but so far, we have not been successful in finding any of high grade, and until we find some to mill with the low-grade ore, it will be impossible to run our mill with any profit. The west cross-cut from the 1000-foot level of Standard vertical shaft is in to-day 95 feet, and will soon be in Bulwer ground. The face of this cross-cut is in very favorable formation; and if we succeed in finding good ore at that depth, it will, of course, enable us to mill the low-grade ore shown in the upper levels. It seems to me that the work of running the cross-cut is very important at the present time, and we are pushing it ahead with all possible speed. Secretary Willis states that, with all indebtedness paid, on March 1st, 1881, the cash surplus was $41,000, and that the net profit from the Bulwer half of the Standard-Bulwer mill for the past seven months is over $61,000.

GRASS VALLEY.

SAN FRANCISCO COPPER COMPANY.—A correspondent of the Marysvale *Appeal* writes as follows from Spenceville: The San Francisco Copper Mining Company, last week, set off a blast of thirteen kegs of giant powder, which brought down upward of 400 tons of five per cent ore, and so thoroughly did the powder do the work that little additional expense is necessary to put the ore in a condition for roasting. The production of the mine at present is about 40 tons of cement copper per month, but which the company hopes very soon to increase to 60 tons per month. What is most needed is a rolling-mill at San Francisco, or some convenient point, where the product of the mine can be reduced to sheet copper, bolts, bars, rivets, etc., for Pacific coast consumption. At present, the cement is shipped to Baltimore, we believe, at an expense of $30 or more per ton. Then the products are reshipped to San Francisco at the same or greater expense. Thus the company suffers an expense of at least $60 per ton, which might be added to the profit were there a rolling-mill for that purpose on the coast. A factory for the manufacture of sulphuric acid would also serve to make the business much more profitable. The cost of the works, it is thought, would not exceed $200,000. The general superintendent of the company informed us that parties were already considering the matter, and that the outlook was encouraging. The company employs about 50 men directly, while many more find employment in furnishing wood, teaming, etc.

COLORADO.

CLEAR CREEK COUNTY.

FREELAND.—The new mill of the Freeland Company, situated at the mouth of Trail Run, has been started up. Its capacity is 50 tons per day.

IDAHO TUNNEL.—The Georgetown *Courier* reports that a contract was let to drive the tunnel 500 feet farther. The tunnel was in 767 feet when the contract was let, and it is confidently believed that some valuable lodes will be intersected before the contract is completed.

LUCERNE.—The *Register-Call* says that a level west from the east or upper shaft has been driven 20 feet, and a vein of mineral has been found. This level seems to have been sunk on a horse or a barren portion of the lode. No other development is making on the line of the company's property outside of what is mentioned above.

PAY ROCK.—The same paper states that the workings of this mine are looking better at present than for some time previous, and the ore output has been correspondingly increased. The mines have been placed in excellent working condition, and preparations are making to develop them on a much more extensive scale than they have ever been worked in the past. There are 58 men employed by the company, the larger portion of whom are taking out ore, and the average value of all the ore sold during the month of February was eleven cents per pound. There are two parties of lessees working on the north wall of the lode, who have an ore-vein that ranges from four to eight inches in thickness, and mills from 600 to 700 ounces for first-class ore, and from 300 to 400 for second-class. The hoisting-machinery has lately been thoroughly overhauled and put in good working order.

CUSTER COUNTY.

The Silver Cliff *Gazette* approximates the daily product of the silver mines as follows: Bull-Domingo, 90 tons; Bassick, 40; Polonia, 7; Twenty-Six, 2; Horton, 1; First Chance, 1; Invincible, 3; Milkmaid, 2; all others, 3; total, 149 tons.

GILPIN COUNTY.

HASELTINE.—The *Register-Call* says: The concentration-works of the company are running again, day times, to their full capacity, that of 15 tons. The manager has let a contract for sinking the main shaft 100 feet, the present depth being 250 feet. Three 8-hour shifts are working in the bottom of the shaft. The 200-foot east and west levels are driven through good ore. The former is in about 15 feet and the latter over 100 feet. A winze from the 100-foot west level is sinking to connect the 100 and 200-foot levels. No work is doing in the adit east of the main working-shaft, but developments will be made when the snow disappears.

PIZARRO.—The same paper says that the working-shaft on the Pizarro lode, on Bald Mountain, has attained a depth of 130 feet, the crevice-matter for the last few feet passed through being a conglomerate mass composed of surface quartz, pyrites of iron, antimony, lead, horn-stone, yellow ocher, and granite. The vein-matter is now concentrating, quite an amount of mineral having been uncovered yesterday by the miners. Present appearances indicate that in sinking to a farther depth of 20 feet, the vein-matter will open out into a good body of mineral. At a depth of 150 feet, the manager will inaugurate levels running east and west on the vein.

RARA AVIS.—This company is sinking its main working-shaft, and after passing through an extensive mica schist, the vein is more clearly defined, and the mineral becoming more solid and compact. At present, the loose ground is being secured by substantial timbering, to avoid delay when the mine shall have attained greater depth. The accumulated mill-dirt is being piled up, awaiting the starting of the Waterman mill, in Eureka Gulch.

GUNNISON COUNTY.

RUBY KING.—The Elk Mountain *Pilot* says: The Ruby King is looming up all the time—the farther it is dug into, the better it seems to get. Work on the first 50-foot level is progressing, the exterior being thirty feet to the northwest and ninety feet to the southwest of the main shaft. From the levels alone, several thousand dollars' worth of ore could be taken out daily if a sufficient number of men were put to work; but just now, the object is not so much to get out mineral as to put the mine in proper shape to get it out rapidly.

LAKE COUNTY.

BIG PITTSBURG.—A strike is reported in the McCormic shaft, near the Lee, Hibernia, and Matchless. The ore-body is eight feet in thickness, and found near the shaft, and is apparently pitching to the south, toward the gulch where the company's property extends. The ore is fine carbonate, filled with chloride, and very rich.

CRESCENT.—The *Democrat* says that the Crescent, located on Carbonate Hill, adjoining the Catalpa property, and which was recently purchased by Boston parties, is being rapidly placed in a producing condition. The whim, which was formerly used for hoisting from the incline, has been supplanted by a fifteen horse-power engine and good hoisting-rig. The principal developments of the mine consist of an incline from 800 to 900 feet in length, running in an easterly direction into the hill. The incline is driven in contact-matter just above the lime, though occasionally the foot-wall makes a roll, when it passes directly through the limestone, and the face of the incline is now in the same formation. From the incline, drifts or cross-cuts are driven both north and south, some of which show very fine and promising ore-bodies. Three hundred feet from the entrance of the incline is No. 3 north cross-cut, which, at the end of 125 feet, terminates in an abrupt incline to the east again, at the foot of which a body of fine ore is exposed, upon which a drift has been started. Twenty-five to 30 feet below and north of this place, the Crescent has some men working, who began at the Catalpa workings, driving south. The drift which is being driven to connect with this body of ore is also in three feet of fine sand carbonates, insuring quite an extensive body of ore. The No. 2 south cross-cut, at 60 feet from the incline, shows about 12 inches of good sand and hard lead carbonates, which has been followed for quite a distance, and is giving great promise of opening up well. The No. 4 south cross-cut showed a seam with good hard carbonate ore, which, during the past few days, has taken a very sharp downward pitch, but is now expected to open up again. The fifth south cross-cut has been driven about 90 feet, and so far discloses only a small seam of mineral. When the present management took charge of the property, it was found necessary to do a great deal of work. Many of the drifts had to be retimbered, new rails laid on a portion of the incline, which now has a track of T rails its entire distance, and much other work. The product for the present month it is estimated will amount to about 200 tons. No work has yet been done on the new shaft, which was sunk on this property last fall. This shaft has a depth of about 100 feet, and is in splendid iron. Work on it will doubtless be started in a few days.

EVENING STAR.—The Leadville *Democrat* gives the following description of the present condition of the workings of this mine: Descending the west or lower shaft, which is also the main working-shaft, to a depth of 135 feet, the middle level and workings are reached, where a drift runs east for a distance of 100 feet, when it takes a southeastward course, and strikes the Catalpa side-line, 200 feet from the west shaft, showing about 30 feet of fine high-grade ore. At 70 feet east of the shaft, a cross-cut runs northward 90 feet. At the junction with the main level, the ore is about six feet in hight, opening up gradually, until at the extremity it reaches a hight of 40 feet. The drift then takes an eastward turn, and runs in ore four sets of timber, or over 30 feet in hight, for over 100 feet. Thirty feet south of this drift, another runs parallel, showing an equally large body of ore, and cross-cuts and other drifts show the ore-body to extend entirely across the property. At 170 feet east of the lower shaft, is a drift running north and south from the Catalpa to the Morning Star line. It was along this drift that a cave was discovered a few days ago, situated in mineral. It has a length of probably 30 feet, and is from two to five feet in hight. The location is directly under a 30-foot body of mineral, and the ore in the roof of the cave is of the same nature as that developed above, except that it bears strong marks of water, and is greatly honey-combed. An assay of sand taken from this place, notwithstanding the leaching it has undergone, probably extending over many ages, assayed twelve ounces in silver and forty per cent in lead. Below the sand is a siliceous iron, which is an exact fac-simile of the oxide of iron in the Morning Star and Fryer Hill mines, that carries much rich chloride of silver. The upper or eastern shaft of the Evening Star is 330 feet east of the lower shaft. It has a depth of 308 feet, penetrating through all indications of mineral. Drifts were started under the ore, which have since proved to have been well-planned, by a series of raises. From the shaft, a drift has been driven within about 40 feet of the workings of the lower shaft, showing about 12 feet of fine ore. About 50 feet west of the shaft, another raise is made, showing three feet of ore. Drifts also run out to the Morning Star line, and then run on the line, westward, 180 feet, showing fine ore nearly all the way, assaying frequently as high as 308 ounces in silver and 75 per cent in lead. A drift has also been driven eastward from the shaft, 130 feet, and a cross-cut run north, showing some good ore, though still in small seams. The workings of the mine are well arranged indeed. All the working levels are below the ore-body, and the mineral, after being broken down, is thrown through a chute, and sent to the shafts by slightly inclining drifts, through which the cars move without the aid of power. The drifts in ore are all substantially timbered, and stoping can be commenced at any time without further outlay of abor or money.

PARK COUNTY.

DOLLY VARDEN.—As noted in a previous issue of the JOURNAL, this famous mine has been transferred to the Boston Gold and Silver Mining Company for $400,000. Below are the official figures of the yield of the Dolly Varden mine proper, since its discovery.

Total value of ore produced from discovery of mine in August, 1872, to January 1st, 1873	$34,798.37
Total value of ore produced during 1874	19,267.16
Total value of ore produced during 1875	36,622.86
Total value of ore produced during 1876	75,397.22
Total value of ore produced during 1877	130,280.40
Total value of ore produced during 1878	44,352.00
Total value of ore produced during 1879	86,318.88
Total value of ore produced during 1880	16,888.08
Total	$443,473.97

We are indebted to the Denver *Republican* for the following history of the mine :

The discovery of the Dolly Varden property was made in the fall of 1872. George W. Brunk and Hon. Assyria Hall were the original discoverers, and until a few days ago were the sole owners of the property. The former had operated in the gold mines of Gilpin and Clear Creek counties before joining the tide that went to Park County, and the latter then occupied a cabin, whose mud-covered roof and barn-like door still attract the gaze of visitors going up Buckskin Gulch.

The property embraces a collection of mines known as Dolly Varden, Hiawatha, Tunnel No. 1, Compromise, Triangle, October, Milwaukee, Bog Silver, Broadway, Tunnel No. 2, German, Friday, Undercliff, Polaris, Iron Dike, Joe Thatcher, Juniata, and Dump Lode. The company has title to 140 acres, embracing eighteen full claims, all of which are patented with the exception of five. The first indications of mineral were found in the Dolly Varden, where the ore cropped from the surface and enabled the eye of an experienced prospector to trace a well-defined vein running across the mountain. The Dolly Varden lies almost at the very top of Mount Bross. Below it is the Hiawatha, from which nearly $200,000 worth of high-grade mineral has been taken. The other claims forming the group lie contiguous to the principal mines and are all joined. The Dolly Varden being the original discovery, is the basis for working the entire property. The boarding-house, store-room, sleeping apartments, offices, and sorting-room of the company are all located on the Dolly Varden claim.

The main entrance to the underground workings of the property is through a tunnel opening into the mine from the sorting-house. This tunnel connects with all the levels, shafts, and stopes on the property, and is used for bringing the mineral into the sorting-house for shipment. It has often been urged against Messrs. Hall & Brunk that they never tested the yielding capacity of the mine, and that the output might have been doubled or trebled if, instead of prospecting through the property, they had concentrated their efforts on mining the ore that was in sight. This method, which unfortunately brought so many of our Leadville mines into disrepute, was never popular with the owners of the Dolly Varden. The property was a private enterprise. They were not under the necessity of impoverishing the mine to meet dividends on a large capitalization, and the revenue derived was sufficiently handsome to repay their efforts and enable them to keep far enough ahead of the ore-bodies that were being worked to see what was beyond them. The fact that in nine years the property has yielded over a million dollars' worth of mineral is pretty conclusive evidence that the policy pursued was a good one. The underground workings of the mine are in admirable condition for a thorough development of the property. During the past few years, the distance into the mine from the main tunnel has become so great as to render it necessary to handle the product of the mine several times before getting it to the surface. To obviate this, a tunnel was started about 200 feet below the mine buildings, which is to intersect the main tunnel and connect by an easier grade with the lower levels. A tramway will connect this tunnel with a mill to be erected on the placer grounds owned by the company, and lying at the base of the mountains on which the property is located. Among other improvements which are to be undertaken is the opening of the road across Hoosier Pass to Breckenridge. This will furnish the only natural outlet in that district, and will connect the mines of Montgomery, Mount Bross, Mount Lincoln, Monte Cristo, and scores of other little camps in that section. There is an easy grade across the pass, and, with a little energy, the road can be kept open all the year. It is the intention of the company to carry all the high-grade ore from the Dolly Varden to its smelter at Breckenridge for treatment.

MONTANA.

The following is from our Montana exchanges :

ALICE.—The latest reports from this mine state that the 100, 200, 300, 400, 500, and 700 foot levels are all vigorously worked. The ore coming out of these levels is of a similar grade to that lately reported, and the variations in the character of the ore in general, taken from the mine, are slight. No extra or unusual volume of water comes in at the 100-foot level.

BELMONT.—This mill is running on ore from the lowest tunnel. The ore comes from 550 feet below the discovery-shaft. A new tunnel running past the caved-in or burnt-out portion of the mine is now in 50 feet. The tunnel made to straighten the way to the old workings will, in 25 feet more, make connection with No. 1 tunnel, when the cost of handling the ore will be greatly reduced. At a recent meeting of the trustees in New York, it was decided to add 20 stamps to the Belmont mill, also new boilers and a 100 horse-power Corliss engine, which will also compress air for the use of the mines when power-drills will be used.

STEVENS.—The Butte *Miner* says : We are pleased to announce the sale of the Stevens mine, by John Stinson, to Marcus Daly, J. K. Pardee, T. A. Bennett, Matlack Davis, and Alfred Wartenweiler. The purchasers are all resident mining and mill men, and they are satisfied that in the Stevens they have a most valuable property, one that will be heard from very soon. Since the purchase, they have sunk the west shaft fifty feet under water, and are now running levels both ways. At this depth, the vein is wide and well filled with high-grade ore. Should the mine fulfill its high promise, Christmas time will see the Stevens 40-stamp-mill hard at work, producing the wherewith to make for its fortunate owners many "dollars of the dads."

The Stevens has always been regarded as the best poor man's mine in the district. It is one of the oldest patented claims in the camp, and is located a short distance southwest of Butte. For the past year, it has been worked under lease to Mr. Samuel Stuart, who, with a small force of men, has explored the vein by three shafts sunk to the water-level. These shafts are about 300 feet apart, and have an average depth of 50 feet—the water-level. From the bottom of the east shaft, the east drift has been extended 70 feet and the west drift 80 feet, the average width of the vein being five feet. Some very fine ore has been produced from this shaft. The stopes of the west drifts have been carried so near the surface that the top soil caved in on the workmen. Besides, in the east and west drifts considerable work has been done on a spur running northwest from the shaft, which has been followed for a distance of 80 feet. This spur is two feet wide, and assays from $75 to $125 per ton. It has not yet been stoped, so that without any further sinking or drifting, a fine body of ore is available for extraction between the drift and the surface. In the middle shaft, next east, the incline is nearly 50 feet deep. The east drift from the bottom is in 60 feet, and the west drift is in 70 feet. From the face of the latter, a spur has been followed for a distance of about 40 feet, the ore being of excellent quality and about 20 inches in width. The main drifts have made a splendid record for themselves. The walls are five feet apart, smooth and well-defined, and the ore-body is in no place less than two feet wide, lying compact and clean on the foot-wall. The ore raised from this shaft has averaged in value during the past year 75 ounces in silver and $10 in gold. It is the oldest shaft on the claim, and has produced many thousands of dollars over and above the working expenses. Mr. Stuart has worked only a small force of men, who have extracted during the year 700 tons of ore, having an average value of $75 per ton, according to the books of Dexter mill, where the product has been treated. The vital need of this property is a full set of hoisting and pumping-apparatus.

NEVADA.

THE COMSTOCK LODE.

The Gold Hill *News* reviews the situation on the Comstock, March 16th, as follows : It is still dead-work at the mines and dead business in the market. There is not a single point on the Comstock to-day where work is doing which is likely to be immediately productive, if the northwest drift on the 2500 level of Sierra Nevada be excepted ; for even the north drifts on the 2100 and 2400 levels of Hale & Norcross are bases for cross-cuts, and Bullion has quit its three east cross-cuts on the 2450 level, and Belcher's upper workings are not yet even into the ledge. It is by no means beyond possibilities but that some of the north end joint east cross-cuts on the 2500 level may strike ore near the clay of the hanging-wall ; but these cross-cuts are run with a view to sink winzes from them, hence are dead-work in the sense in which that expression is used above. The north drift on the 2500 level of Sierra Nevada may do the same ; still it is run as a base for cross-cuts and as a general thoroughfare. The joint Ophir-Mexican winze may drop into ore ; still it is a part of the dead-work doing in accordance with the general plan for the development of the north end mines. The Sierra Nevada drift is really the only one run for developments directly. No wonder, therefore, that the market waits developments. The consolation is, however, that this waiting and this dead-work can not monopolize every thing much longer. The probabilities are, that by next Saturday connection will be made between Jacket and the Sutro Tunnel. The Jacket pumps will then be started very soon—just as soon, in fact, as the drain-boxes can be laid. Bullion is getting ready for business. It will take ten or twelve days to complete the improvements contemplated, and then probably connection with the Sutro Tunnel will be made before the cross-cuts are driven much farther, for a flood would be disastrous. Sierra Nevada continues to yield 40 to 50 tons of ore per day, the Bonanza mines 60 to 70 tons, and the Crown Point 40 to 45 tons. This, with what is taken from the croppings from the Confidence by Stevensen, and from the Belcher by Briggs, constitutes the present output of the Comstock. Mining is at a low ebb ; but before April passes, much more work will be doing, whether the output of ore is greater or not. One permanent step in advance will be taken before the week closes. The joint Sierra Nevada-Union winze will be started for the 2700 level, and sinking will be resumed in the Union shaft under more favorable conditions.

PROPOSALS AND SALES.

For the benefit of many of our readers, we compile weekly such proposals and solicitations for contracts, etc., as may be of interest. The table indicates the character of proposals wanted, the full name and address of parties soliciting, and the latest date at which they will be received :

Erection of a new Brick School Building at Portchester ; for particulars address Board of Education, Portchester, N. Y.	
For Grading, Masonry, and Bridging of the Kentucky Central Railroad Extension from Lexington to Richmond, and from Richmond to Roundstone Junction ; also from Paris to Winchester and from Winchester to Richmond ; J. R. Ledyard, Superintendent of the Kentucky Railroad Company, Covington, Ky	March 28, 1881.
Repairing the Three Public Baths belonging to the City of Brooklyn and Furnishing certain Supplies for their Use ; Commissioners of the Department of City Works, Municipal Department Building, Brooklyn, N. Y.	" 30, "
For the Construction of the Buildings required in connection with the Workshops to be erected at Montreal ; plans, specifications, and all other information may be obtained at the office of the Government Engineer, 16 St. James street, Montreal, on and after this date ; J. A. Chapleau, Commissioner of Agriculture and Public Works, Quebec, Canada.	" 31
Furnishing Materials and Labor for Constructing the Iron Superstructure for a Bridge over the Cuyahoga and Summit counties road, at Brecksville Station Valley Railroad. The bridge will consist of one span of about 128 feet in length, and roadway 16 feet in the clear. Bidders will furnish their own plans for the superstructure, which plans must be full and clear and be accompanied with specifications and strain sheet on following basis : 80 pounds per square foot of bridge, in addition to its own weight, to a factor of safety of 5. No iron to be strained more than 10,000 pounds per square inch ; iron in compression to be proportioned after Gordon's formula for columns, using 8000 pounds per square inch as maximum. Blank proposals can be obtained at the office of the Commissioners in Cleveland. The Commissioners reserve the right to reject any or all bids. Commissioners of Cuyahoga and Summit Counties, Commissioners' Office, Cleveland, O.	" 31, "
Furnishing about 390,000 pounds of Iron Drift Bolts, required for Cribs in the Extension Breakwater at Chicago, Ill. They will be of one-inch round iron, in lengths varying from sixteen (16) to thirty-two (32) inches. For complete bill, specifications, blanks for proposals, and all information, apply at this office ; G. J. Lydecker, Major of Engineers, U.S.A., 25 Honore Buildings, Chicago, Ill.	April 5, "
Excavating about two and one quarter Million Cubic Yards of Material from the Channel leading to the Harbor at Baltimore ; William P. Craighill, Lieutenant-Colonel of Engineers, U. S. Engineer's Office, 70 Saratoga street, Baltimore, Md.	" 7, "
Construction of 3000 Linear Feet of Pile Revetment on the Sides of the Sturgeon Bay Ship-Canal as per plan and specifications on file in this office ; W. T. Casgrain, Chief-Engineer, Sturgeon Bay and L. M. Ship-Canal and Harbor Company, Room 5, No. 12 Wisconsin street, Milwaukee, Wis	" 7, "
For Grading, Curbing, Guttering, Paving, and Construction of Cross-Walks on East Market street, from the old western boundary of Middlebury Township to the west line of Water street. The entire length of said improvement is in what is now known as the Sixth Ward of Akron City. The work proposed for, including curbing, gutter-stone, corner blocks, paving, and crossings, shall consist of the kind known as Medina sandstone No proposal will be accepted unless on a blank furnished by the City Civil Engineer, City Clerk's Office, Akron, O.	" 9, "
Transportation of Military Supplies in the Department of Texas during the fiscal year commencing July 1st, 1881, and ending July 30th, 1882. Blank proposals, form of contract, and printed circulars, stating the estimated quantities of supplies to be transported, and giving full information as to the manner of bidding, conditions to be observed by bidders, and terms of contract and payment, will be furnished on application to this office, or to the offices of the Quartermasters at Fort Brown, Texas, New Orleans, La., and St. Louis, Mo. ; Benjamin C. Card, Chief Quartermaster, San Antonio, Texas.	April 12, "
Monument to be Erected in Rome for late Victor Emanuel II., First King of Italy ; President of the Royal Commission, Cairoli, and the Secretary of the Royal Commission, etc., Rome, Italy	Sept. 21, "

Bethlehem & Belvidere Railroad Company.—A charter has been issued to this company. The road is to be built from a point on the Lehigh & Lackawanna Railroad, near Brodhead's Station, to the Delaware River at or near Belvidere, with the right to bridge the Delaware River at or near Belvidere, the road to be sixteen miles long and within the county of Northampton.

Shenandoah Valley Railroad.—Work has been rapidly pushed, and it is expected that trains will be running from Harrisonburg to Waynesboro' by the 15th of April. The company already has in contemplation the construction of several branch lines, one east from Berryville to the copper regions of Loudon County, Va., and west through the silver and iron regions of Preston and Monongalia counties, West Va. ; east from Christiansburg to the iron of Franklin County, and west to the coal of Summers County ; and east from Wytheville to the copper of Carroll County, and west to the coal of Camp Creek.

Toledo, Delphos & Burlington Railroad.—It is reported that the stockholders of this company have confirmed the contract of consolidation with the Dayton & Southwestern, whose stockholders took similar action some time ago. This action will add about 200 miles to the Toledo, Delphos & Burlington system, opening up extensive fields of coal and iron ore, and by the extension to Huntington, West Va., will give a new outlet to tidewater via the Chesapeake and Ohio.

Underground Railroad at Chicago.—Recent reports state that a movement is taking form in Chicago to build an underground railroad from the river north to the city limits, in connection with the proposed rapid-transit system to Evanston and Lake Forrest. The cost of tunneling and laying a track in the tunnel to the city limits is estimated at $2,600,000.

FINANCIAL.

Gold and Silver Stocks.

NEW YORK, Friday Evening, March 25.

The business in mining stocks, although a very large one, does not attract much attention, owing to the failure of any of the stocks to suddenly and largely increase in value on merit. The sales aggregated 1,048,719 shares last week, and 1,049,789 shares this week. There is but little to indicate a change. The outlook does not point to smaller returns from the producing mines, while with the opening of spring, there is a chance for some returns from some of the mines that have, so far, done little or nothing.

Alice has been quiet and strong, with sales of 1300 shares at $7.50@$8. Amie has had a fair business at irregular prices, the sales amounting to 64,050 shares at 48@54@50c. The sales of Argenta amount to 300 shares at 35@30c. Bassick has been more active than of late, but at weaker prices; the sales aggregate 965 shares at $10.25@$10. Belle Isle has had a liberal business at 60@55c., with sales of 3150 shares. Bodie has been quiet and steady, with sales of 410 shares at $5.50@$6.50@$5.88. Breece only records sales of 200 shares at $1.85. California has had a fair business at quite irregular prices, the sales amounting to 2190 shares at 90c.@$1@96c. Chrysolite has been moderately active at irregular but weaker prices. The sales aggregate 10,880 shares at $7@$6.25. This mine is not looking as well as it did, although the treasury steadily improves. Climax has had a fair business at weak prices, the sales amounting to 11,330 shares at 57@72@60c. Consolidated Virginia has been quiet and steady, with sales of 4330 shares at $1.55@$1.65. The sales of Copper Knob aggregate 7400 shares at 5c. Dunkin, with a fair business, was quite weak at one time, but grew stronger at the close; the sales amount to 5300 shares at $1.75@$1.20@$1.55. Eureka was weak, with a business of 120 shares at $26@$23@25. Excelsior records sales of 100 shares at $5.50, and Father de Smet 225 shares at $11.50@$10.50. Findley was dealt in to the extent of 300 shares at 29@28c., and Freeland 100 shares at $1.95. Gold Stripe has been active and strong, the sales amounting to 10,025 shares at $2.90@$3.15@$3. Grand Prize has had a liberal business at prices a little weak; the sales aggregate 1870 shares at $1@80@90c. Great Eastern has been a trifle weak, with sales of 16,000 shares at 30@27c. Green Mountain has been quiet and strong, the sales aggregating 3100 shares at $6.25@$6.50. Hibernia continues to be the feature of the market, the sales aggregating the enormous sum of 274,100 shares. The price has been irregular, ranging between 97@82@92c. Horn-Silver, with a fair business, continues to grow weaker; the sales amount to 1125 shares at $10.25@$9. Hukill has been quiet and a little weak, the sales aggregating 8600 shares at $1.30@$1.15. Independence has been quiet and a little weak, with sales of 600 shares at 38@35c. Leadville has been liberally dealt in at weakening prices; the sales aggregate 17,831 shares at $1.05@85c. Little Chief has been quiet and weak, with sales of 6050 shares at $1.45@$1.35. Little Pittsburg, with a moderate business, has been weak, the sales amounting to 2700 shares at $3.60@$3. Moose has had a moderate business at weak prices, the sales aggregating 6150 shares at $1.70@$1.55. Navajo has been weak, ranging from $2.40@$1.65, with sales of 4800 shares. Northern Belle records sales of 50 shares at $13.50, and Ontario 200 shares at $37@$36. Rising Sun has been quite active at irregular prices, the sales aggregating 15,325 shares at $2.75@$3.15. Robinson Consolidated has had a moderate business at irregular prices; the sales amount to 2850 shares at $9.50@$8.50@$9.25. Sierra Nevada has been strong, with a moderate business, the sales amounting to 475 shares at $6.25@$7. Silver King records sales of $100 shares at $23, and Spring Valley, 600 shares at $3. Standard has been quiet and strong, with sales of 410 shares at $25½@$26¾. Starr-Grove has been quiet and a little strong, the sales aggregating 600 shares at $5.88@$6.13. Stormont records sales of 700 shares at $2.25@$2.13. Silver Islet has been dealt in to the extent of 15 shares at $29½, and Potosi 100 shares at $2.25.

Alta-Montana records a fair business at steady prices, the sales amounting to 3000 shares at $2.05@$2.20. American Flag has been steady, with sales of 8000 shares at 31@28c. Bald Mountain records sales of 1000 shares at 10c. Barcelona has been dealt in to the extent of 3700 shares at $1.10@1.05. Bechtel records sales of 2625 shares at 60@50c. Big Pittsburg has had a liberal business at weak prices; the sales amount to 10,822 shares at $3.50@$3.05. Black Jack, with a business of 3900 shares, has ranged between $1.10@$1.30. Boston Consolidated has been quiet and irregular, with sales of 7100 shares at 60@70@65c. Boulder Consolidated has had a fair business at irregular though stronger prices, the sales aggregating 10,200 shares at 75@88@81c. Buckeye has been dealt in to the extent of 5800 shares at 20@19c. Bull-Domingo has been active, irregular, and strong, the sales amounting to 12,475 shares at $2.05@$2.70. Bullion records sales of 100 shares at 20c. Bulwer has been quiet and strong, with sales of 1460 shares at $1.90@$2.05. By and By has been dealt in to the extent of 200 shares at 13@12c. Calaveras has been quiet and a little weak, the sales aggregating 8600 shares at 22@20c. Caledonia (B. H.) has had a moderate business at strong prices; the sales aggregate 900 shares at $1@$1.40. Carbonate Hill has been weak, with sales of 8400 shares at 20@8c. Central Arizona has been moderately dealt in at irregular prices; the sales amount to 1850 shares at $4⅞@$5. Cherokee has been quiet and irregular, with sales of 6800 shares at $2.20@$2.05. Colorado Central records sales of 1000 shares at 50c. Consolidated Imperial has been dealt in to the extent of 3200 shares at 13@11c. Consolidated Pacific has been quite active and irregular, the sales amounting to 22,700 shares at 96@70@77c. The sales of Crowell aggregate 1500 shares at 5c., and of Dahlonega 3700 shares at 8c. Dunderberg records sales of 200 shares at $1@90c. Durango has been quiet, with sales of 11,900 shares at 15@17c. Empire records sales of 200 shares at $1@90c. Glass-Pendery has been dealt in to the extent of 3200 shares at $2@$1.85. Goodshaw has been irregular, with sales of 6600 shares at 76@90@83c. Granville records sales of 44,400 shares at 3@5c. Hortense has been active and irregular, the sales aggregating 31,900 shares at 60@71@65c. Iron Silver, with a moderate business, has been irregular; the sales amount to 1350 shares at $3.50@$3.75@$3.45. Lacrosse has been dealt in to the extent of 15,200 shares at 33@28c. Legal Tender has been liberally dealt in at very weak prices; the sales aggregate 12,800 shares at $4@$2.50. Lucerne has been strong, with a business of 17,700 shares at 12@17c. Mariposa Preferred has been quiet and weak with sales of 512 shares at $6.75@$5.75. Mariposa Common has had a fair business at irregular though stronger prices, the sales amounting to 3964 shares at $3.90@$4.70@$4.30. May Belle records sales of 400 shares at 14@10c., and Mayflower 500 shares at 42@40c. Mineral Creek has been very liberally dealt in at quite irregular prices; the sales amount to 38,200 shares at 73@52@70c. Miner Boy has had a fair business at irregular prices, the sales amounting to 6100 shares at $1.70@$1.50. North Standard has been quiet and weak, with sales of 7100 shares at 23@18c. The Quicksilver stocks have been quiet and weak, Preferred recording sales of 300 shares at $61½@$61, and Common 270 shares at $16@$15½. Rappahannock has been dealt in to the extent of 900 shares at 15@14c. Red Elephant, with a fair business, has been weak; the sales aggregate 5300 shares at 31@27c. Silver Cliff has been quiet and weak, the sales aggregating 4950 shares at $5@$4.40. Silver Nugget has been active and strong, the sales amounting to 72,280 shares at 9@30c. The new stock has ranged between 40@52c., with sales of 25,550 shares. South Hite has been dealt in to the extent of 600 shares at 42@40c. Sutro Tunnel has been very active and quite strong; the sales amount to 65,585 shares at $1.35@$1.75@$1.65. Tuscarora has been active and strong, with sales of 8000 shares at 16@23c. Unadilla has been dealt in to the extent of 12,800 shares at 15@13c. Union Consolidated has been quiet and strong, the sales aggregating 250 shares at $6.50@$7.50. Vandewater, with a fair business, has been irregular, the sales amounting to 6300 shares at 52@57@54c. Willshire has been quiet and steady, with sales of 3500 shares at $1.45@$1.60@$1.50. Cheyenne has been quite active and strong, the sales aggregating 22,700 shares at 65c.@$1. Head Center records sales of 100 shares at $4.10, and Cosette 200 shares at $1.25.

UNLISTED QUOTATIONS.

Mr. L. V. Deforeest, No. 70 Broadway, under date of March 25th, 3 P.M., reports:

	Bid.	Offer'd		Bid.	Offer'd
Barcelona	$1.05	....	O. K. & Winnebago	....	$1.00
Breece	1.50	1.70	Patagonia	....	.75
Bald Mountain	.08	.10	Plata Verde	....	2.50
Carbonate Hill	....	.25	Rico	....	.75
Con. Arizona	....	1.25	Rocker	....	.50
Empire of Cal.	....	2.00	Sacramento	....	1.50
Empire, Utah	.50	1.00	Santa Cruz	....	.75
Freeland	1.75	....	Sir Rodr'k Dhu	.15	.25
Grand View	....	.70	Stormont	2.10	2.20
Highland Chief	5.00	8.00	Silver Nugget	.28	.30
Julian	.50	2.00	State Line, Nos. 1 and 4	1.00	1.25
Lowland Chief	.25	....	State Line, Nos. 2 and 3	4.00	4.50
Mack Morris	....	4.00	Trinity	....	2.00
May Flower	.35	.45	Vandewater G.	.53	.54
Native Silver	....	.50			
New Philadel	....	.25			
North Hite	....	.75			

A judgment has been obtained against the Colorado Prince Company for $5513, the balance due for the company's new mill.

The meeting of the Bald Mountain stockholders resulted in the passage of the resolution to diminish the stock to 100,000 shares of $10 each. This was carried by a vote of over 775,000 shares.

The Hibbard Antimony Company, of New Brunswick, has issued a report enumerating the company's property and developments. The management announces that it is ready to begin producing, and that it has offers for its full product at profitable prices.

At a meeting of the Gold Placer Company recently, it was decided to reduce the capital stock from $5,000,000 to $100,000, and the value of the shares from $25 to 50 cents. Also to increase this capital to $150,000, by the issue of new stock to be subscribed for by the stockholders.

The mining companies against whom Attorney-General Ward is about to bring suits for the nonpayment of their delinquent tax on capital stock are the Spring Valley Hydraulic, Noble Consolidated, Rosier Gold and Silver, Native Silver, St. Joseph Lead, Hector, La Plata, North Star, "C. O. D.," Brewer, Crook, and the Carbon Consolidated. Actions will begin as soon as the necessary papers can be made out and served.

Judge Hallett has decided that the Smuggler claim is to be surveyed, after which the Robinson Company is at liberty to work the claim, but must pay one half the gross proceeds into court to abide the result of the sult of Jacque and others. The plaintiffs are also allowed to appoint a person to represent their interests with the Robinson Company and see that a fair account is rendered.

We are in receipt of prospectus and report on the properties of the Dardanelles Consolidated Gravel Mining Company. This company has recently secured control of several properties located on Forest Hill Divide, Placer County, California. Some of these claims have yielded largely in the past, and their future prospects are favorably reported upon by some of the best authorities. The management of the company appears to be in capable and competent hands, and comprises some of the best citizens of Boston.

Considerable inquiries have recently been made relative to the Excelsior Water and Mining Co. We are permitted to take the following from a private letter: The prospects are more favorable than they been for some time past. The Smartsville claim has developed a bunch of gravel which has every appearance of being a channel, and has, by common consent, been considered the best gravel struck since the old Blue Gravel mining days. It is so located as to warrant the belief that it is the western end of the lead which the shaft in the Deer Creek cuts on the east. If this is so, in about two months the tunnel in the Deer Creek will be finished, and washing will be done from both ends of a very rich body of gravel. The Pittsburg, one of the Excelsior's claims, is also in very good gravel. The Deer Creek tunnel and the big cut in the Smartsville will be completed within the next two months. There is an abundance of water, and ditches are in good order. Large returns are expected during the coming season.

We publish in another column the report to the stockholders of the Boston Gold and Silver Mining Company, a statement announcing the purchase of the Dolly Varden mine, with some very interesting facts in relation to its past production. The statement ap-

GENERAL MINING STOCKS.

Dividend-Paying Mines.

NAME AND LOCATION OF COMPANY.		Feet on Vein.	Capital Stock.	SHARES. No.	SHARES. Par Val	ASSESSMENTS. Total levied to date.	ASSESSMENTS. Date and amount per share of last.			DIVIDENDS. Total paid to date.	DIVIDENDS. Last Dividend.			HIGHEST AND LOWEST PRICES PER SHARE AT WHICH SALES WERE MADE. March 19. H.	March 19. L.	March 21. H.	March 21. L.	March 22. H.	March 22. L.	March 23. H.	March 23. L.	March 24. H.	March 24. L.	March 25. H.	March 25. L.	SALES.
Alice				460,000						40,000	Mar.	1880	10	7.50		7.75								1,300
Amie Con. s. L	Col.		5,000,000	500,000	10	*				305,000	May.	1880	10	.53	.18	.54	.51	.52	.50	.51	.49	.51	.50	61,050
Argenta, s	Nev	1,500	10,000,000	100,000	100	130,000	Mar..	1881	20	40,000	Feb.	1880	20											300
Barbee & Walker	U'h		1,000,000	100,000	10	*				90,000	Nov.	1880	10											
Bassick, G. S	Col.		10,000,000	100,000	100	*				25,000	Feb.	1880	25	10.25	10.13	.60	.50			10.00				965
Belle Isle, G. S	Nev.	1,500	10,000,000	100,000	100	30,000	Feb.	1880	30	300,000	Dec.	1879	25							.55		.60	.55	.59	.55	3,150
Belcher, G. S	Nev.	1,040	10,400,000	104,000	100	2,250,000	Feb..	1881	50	15,397,200	Apr.	1876	75											
Bodie Cons., G	Cal.		10,000,000	100,000	100	75,000	May.	1879	1 00	1,200,000	Mar.	1880	25			6.00	5.50	6.50	5.88					410
Breece	Col.		5,000,000	200,000	25					2,000	Feb.	1880		1.85										200
California, G. S	Nev.	600	54,000,000	540,000	100					31,320,000	Dec.	1879	50	.95		.98	.90	.97	.90	1.00	.95			2,190
Calumet & Hecla, C	Mch		2,500,000	100,000	25	200,000				18,250,000	Feb.	1880	5 00											
Caribou Con., G	Col.	1,400	1,000,000	100,000	10	*				50,000	Mar	1880	10											
Chrysolite, S. L	Col.		10,000,000	200,000	50	*				1,100,000	Apr.	1880	50	7.00	6.88	7.00	6.75	6.88	6.25	6.38	6.25	6.63	6.25	6.88	6.38	10,880
Climax, S. L	Col.		2,000,000	200,000	10	*				180,000	Aug.	1880	30	.67	.57	.72	.64	.68	.63	.66		.62		.64	.60	11,300
Cons. Virginia, G. S	Nev.	710	54,000,000	540,000	100	411,200	June	1873	3 00	42,930,000	Aug.	1880	50	1.60	1.55	1.65	1.55	1.60	1.55	1.65	1.60	1.60		1.65	1.60	4,380
Copper Knob	N. C.		1,000,000	1,000,000	1	*				15,000	Nov.	1880	02	.06		.05		.05		.05		.05				7,400
Crown Point, G. S	Nev.	600	10,000,000	100,000	100	2,523,370	Dec.	1880	0 50	11,588 000	Jan..	1875	2 00											
Deadwood Terra G	Dak		5,000,000	200,000	25					1,200,000	Mar.	1881	25											
Dunkin	Col.		5,000,000	200,000	25					145,212	Mar..	1881	12½	1.75	1.65	1.75	1.20	1.70	1.60	1.65	1.60			1.55	1.50	5,300
Eureka Cons., G. S. L	Nev.		5,000,000	50,000	100	100,000	May.	1876	1 00	4,580,000	Mar..	1881	50	26.00						23.00		24.00		25.00		120
Excelsior W'k'r & M. Co	Cal.	525 acres	10,000,000	100,000	100					850,000	Sept.	1880	25	5.50										100
Father de Smet, G	Dak		10,000,000	100,000	100					20,000	Mar.	1881	25			11.50						11.50		10.50		225
Findley, G	Geo.		200,000	200,000	1	*				8,000	May.	1879	10							.29		.28				300
Freeland	Col.		5,000,000	200,000	25	*				50,000	May.	1880	25			1.95										100
Gold Strip	Cal.		1,500,000	150,000	10					67,500	Mar..	1881	15	3.00	2.90	3.10	3.00	3.15	3.10	3.20	3.15	3.05		3.05	3.00	10,025
Gould & Curry, G. S	Nev.	612	10,800,000	108,000	100	3,260,000	Feb.	1881	50	3,826,800	Oct.	1870	10 00											
Grand Prize, S	Dak	1,500	10,000,000	100,000	100	225,000	Dec..	1879	0 75	450,000	Sept.	1880	0 25	1.00		1.00	.90	.90		.90	.85	.85	.80	.90		1,870
Great Eastern, G	Dak	1,200	300,000	300,000	1	*				16,000	July.	1880	01	.30	.25	.30	.28	.30	.29	.28	.27	.29	.28	.28	.27	16,600
Green Mountain, G	Cal.	4,350	1,250,000	125,000	10	*				137,500	Mar..	1881	05	6.38	6.25	6.50	6.38	6.50	6.38			6.50				3,100
Hale & Norcross, G. S	Nev.	400	11,200,000	112,000	100	3,586,000	Mar.	1881	50	1,598,000	Apr.	1871	5 00											
Hibernia	Col.		7,500,000	300,000	25					90,000	Feb.	1881	10	.95	.89	.97	.84	.93	.87	.91	.82	.94	.82	.97	.92	274,100
Homestake, G	Dak		10,000,000	100,000	100	200,000	Apr.	1878	1 00	930,000	Mar..	1881	30											
Horn Silver, S. L	Utah.		10,000,000	400,000	25	*				200,000	Jan..	1880	25	10.25	10.00					10.00		10.00	9.75	9.88	9.00	1,125
Hukill, G. S	Col.	3,288	1,000,000	200,000	5	*				210,000	Dec.	1878	10	1.30	1.20	1.25	1.20	1.30	1.20	1.25		1.20		1.25	1.15	8,600
Independence, S	Nev.	1,500	10,000,000	100,000	100	135,000	Apr.	1880	0 25	225,000	Sept.	1879	25	.35		.38				.37				.36	.35	600
Indian Queen	Nev.		250,000	125,000	2					250,000	Mar.	1881	4											
La Plata, S	Col.		2,000,000	200,000	10	*				285,000	Mar..	1881	7½											
Leadville Cons., S. L	Col.		2,000,000	200,000	10	*				150,000	Jan.	1880	15	1.05	.87	1.05	.90	.97	.94	.95	.89	.88	.85	.93	.88	17,831
Leeds, S	Uth.	3,000	6,000,000	60,000	100	36,000	Feb.	1881	15	78,000	Oct.	1878	15											
Leopard, L. G. S	Nev.	1,500	5,000,000	50,000	100	372,500	Apr..	1880	10	162,500	Dec	1876	50											
Little Chief, S. L	Col.		10,000,000	200,000	50	*				700,000	Aug.	1880	50	1.45	1.30	1.40	1.35	1.45	1.35	1.40	1.35			1.35		6,050
Little Pittsburg, S. L	Col.	30 acres.	20,000,000	200,000	100	*				1,350,000	Mar..	1880	50	3.60	3.50	3.50		3.55	3 50	3.50	3.40	3.40		3.50	3.00	2,700
Martin White, S	Nev.	22,900	10,000,000	100,000	100	825,000	Dec..	1880	25	90,000	July.	1879	50											
Moose, S	Col.	30,000	2,000,000	200,000	10	*				550,000	Mar.	1878	25	1.70	1.60	1.70	1.60	1.60		1.65	1.55	1.60	1.55	1.65	1.55	6,150
Napa Cons., G	Cal.		10,000,000	100,000	100					149,000	Nov.	1880	10											
Navajo	Nev.	500	10,000,000	100,000	100	175,000	Dec.	1880	0 20	25,000	Mar.	1881	20	2.40	2.30	2.30	2.30	2.40	2.35			2.25	2.10	2.10	1.65	4,800
N. Y. & Colorado, G	Col.		1,000,000	50,000	20	*				25,000	July.	1879	10											
Northern Belle, S	Nev.	1,500	5,000,000	50,000	100					1,775,000	Mar..	1881	50					13.50								50
North Belle Isle	Nev	1,500	10,000,000	100,000	100	25,000	Feb..	1880	15	15,000	Sept.	1880	15													
Ontario, S	Utah.	3,000	10,000,000	100,000	100	*				3,250,000	Mar.	1881	50	37.00	36.00											200
Ophir, G. S	Nev.	675	10,080,000	100,800	100	3,092,600	Mar.	1881	1 00	1,003,200	Jan..	1880	1 00													
Ore Knob, C	N. C.	1,600 acs.	1,500,000	150,000	10	*				173,300	Sept.	1880	25													
Plumas, G	Cal.		1,000,000	100,000	10	715,000				151,000	July	1879	8													
Raymond & Ely, G. S	Nev.	5,000	12,000,000	120,000	100	955,000	Aug.	1880	2 00	3,075,000	Sept.	1873	3 00													
Rising Sun	Cal		750,000	150,000	5	*				90,000	Feb.	1881	15	3.30	2.95	3.15	2.75	3.10	3.05	3.15	3.05	3.10	3.05	3.15	3.05	15,325
Robinson Cons	Col.		10,000,000	200,000	50	*				175,000	Sept.	1880	50	9.50	5.25	9.00		8.50				8.75	8.50	9.25	8.75	2,850
Sierra Nevada, G. S	Nev.		10,000,000	100,000	100	4,450,000	Jan.	1881	1 00	102,000	Jan.	1871	1 00	6.50	6.25					7.00	6.75					475
Silver King, S	Ariz		10,000,000	100,000	100					575,000	Mar.	1881	2							23.00						100
Spring Valley	Cal.	3,650	200,000	200,000	1	*				50,000	Jan.	1881	5							3.00		3.00				600
tandard, S	Cal.	1,500	10,000,000	100,000	100	50,000	July	1878	1 00	2,500,000	Mar.	1881	75					25½	25	26	25½	26⅜	25⅞	25⅞		410
tarr-Grove, S	Nev.		2,000,000	200,000	10					80,000	Feb..	1881	10			6.00		5.88		6.00		6.13	6.00	6.13		600
tormont, S	Uth.		150,000	150,000	1	*				155,000	Nov.	1880	90									2.25		2.25	2.13	700
ombstone, S	Ariz		12,500,000	500,000	25	*				600,000	Mar.	1881	10													
ellow Jacket, G. S	Nev.	1,200	12,000,000	120,000	100	3,978,000	Oct..	1880	1 00	2,184,000	Aug.	1871	2 50													

Non-Dividend-Paying Mines.

Alta-Montana	Mon		5,000,000	500,000	10	*								2.10		2.20	2.15			2.20	2.05	2.20		2.20		3,000
Am. Flag, G	Col	5,300	1,250,000	125,000	10	*								21c	22c	31c	28c	51c	29c	29c	28c	29c		28c		8,000
Bald Mountain	Colo		10,000,000	1,000,000	10	*								10c												1,000
Barcelona	Nev		5,000,000	200,000	25											1 10				1.10	1.05					3,700
Bechtel Con., G	Cal.		10,000,000	100,000	100	162,750	Dec.	1880	0 15											60c		6 c	50c			2,625
Best & Belcher, G. S	Nev.	545	10,080,000	100,800	100	942,960	Dec.	1880	50																	
Big Pittsburg	Col.				100									3.50	3.30	3.45	3.05	3.30	3.20	3.40	3.25	3.35	3.10	3.25	3.05	1,822
Black Jack	Cal.		2,500,000	100,000	2½											1.15				1.15	1.10	1.20	1.10	1.30		3,000
Bonanza Chief	Mon		1,000,000	1,000,000	1	*																				
Boston Con, G	Cal.		10,000,000	100,000	100									71c	70c	70c	69c	70c	67c	68c	63c	70c	68c	68c	65c	7,100
Boulder Con	Colo		2,000,000	200,000	10									77c	75c	80c	78c	87c	84c	82c	80c	82c	80c	81c		1,200
Buckeye	Col.		2,000,000	400,000	5	*								20c	19c	19c		19c		19c				19c		5,800
Bull-Domingo	Colo		10,000,000	200,000	50	*								2.40	2.35	2.40	2.05	2.40	2.15	2.40	2.25	2.75	2.50	2.70	2.5	12,475
Bullion, G. S	Nev.	943½	10,000,000	100,000	100	452,000	Feb..	1881	1 00							2 c										100
Bulwer, G	Cal.		10,000,000	100,000	100	50,000	Dec..	1877	50							2.00	1.90	2.0				2 05	2.00	2.05	2.00	1,400
Bye and Bye	Ariz		1,000,000	100,000	10	*										12c										200
Calaveras, G	Cal.	2,600 acrs	500,000	500,000	1	*								21c		22c	21c	21c		2 c		21c	20c	21c		8,000
Cal., B. H., G	Dak.		10,000,000	100,000	100	375,000	Oct..	1880	0 50							1.35	1.00	1.40	1.30	1.35		1 40				900
Carbonate Hill	Col.		2,000,000	200,000	10											2 c	1 8c	10c	8c							8,400
Catskill	Nev.		1,500,000	30,000	5																					1,050
Central Arizona, S	Ariz		12,000,000	100,000	100									6.38	6.25	6.25		6.25				6.25		6.25		1,050
Cherokee, G	Cal.		1,500,000	150,000	10									5.00	4⅞	5.00		5 00		4⅞		5.00		5.00		1,850
Cheyenne	Dak.		1,000,000	200,000	5											2.10	2.05	2.15	2.05	2.2	2.05	2.1		2.10	2.05	6,800
Colorado Central	Col.		3,000,000	300,000	10									65c	65c	70c	68c	8 c	7 c	90c	81c	94c	87c	1.00	89c	22,700
Columbia Con., G. S	Nev		5,000,000	100,000	50													50c								1,000
Cons. Imperial, G. S	Nev.	468	50,000,000	500,000	100	1,325,600	Jan..	1881	0 10																	
Con. Pacific, G	Cal.	1,400	6,000,000	60,000	100	50,000	July.	1880	0 50					12c	12c					12c		12c		11c		3,200
Crowell	N. C.		500,000	500,000	1	*								66c	72c	90c	70c	86c	80c	83c	76c	77c	76c	77c		22,700
Dahlonega, G	Ga.		250,000	250,000	1	*														6c		6c				1,500
Dunderberg	Colo		1,500,000	150,000	10	*										8c								8c		3,700
Durango	Dak.		500,000	500,000	1	*																1.0		90c		200
Empire	Ut'h																	10c		16c		16c	15c	17c	15c	11,900
Girard	Ariz																					1 0c	90c			200
Glass Pendery	Col.				2																					
Glynn Dale Con. G	Cal.		10,000,000	100,000	100	75,000	Jan..	1881	0 25									2.00	1.85	1 90	1.85	1.85				3,200
Gold Placer, G	Col.		5,000,000	200,000	25	*																				
Goodshaw, G	Cal.		10,000,000	100,000	100	145,000	Feb..	1881	15																	
Granville, G	N. C	1,251 acs.	300,000	1	*									72c	70c	88c	78c	80c	74c	90c	15c	87c	79c	80c	81c	6,600
Harshaw	Ariz		10,000,000	100,000	100											4c		5c	4c	5c		5c	4c	5c	4c	44,400
Head Center																										
Hortense	Col.		2,000,000	200,000	10	*								4.10												100
Iron Silver	Colo		10,000,000	500,000	20	*								68c	60c	71c	66c	69c	67c	68c	66c	68c	66c	66c	65c	31,900
Lacrosse	Col.	3,600	1,000,000	100,000	10	*										3.50		3.70	3.50	3.60	3.50	3.75	3.45			1,350
Legal Tender	Col.													32c	29c	32c	32c	29c		31c		30c	29c	30c	28c	15,200
Leviathan	Nev	2,000	10,000,000	100,000	100	325,000	July.	1880	15					3.90	3.75	4.00		3.65	3.25	3.25	2.70	2.75		2.50		12 800
Lucerne	Col.	4,200	5,000,000	500,000	10									18c	12c			12c	12c	14c	13c	16c	12c	17c	15c	17,700
Mariposa preferred	Cal.	14,587	5,000,000	50,000	100	1,425,000	Dec.	1880								6.50	6.00	6.75	6.50			5.75				512
" common	Cal.	acres.	10,000,000	100,000	100	1,425,000	Dec..	1880						4.4	3.90	4.70	4.00	4.60	4.50	4.35	4.25	4.25	4.25	4.30		3,964
May Belle, G	Cal.	1,500	10,000,000	100,000	100	66,000	Mar..	1881	0 16							12c		14c						10c		400
Mayflower	Colo		1,000,000	100,000	10	*								42c	40c											500
Mexican, G. S	Nev.	600	10,080,000	100,800	100	1,488,200	Jan..	1881	0 50																	
Mineral Creek	Ariz		2,000,000	200,000	10	*								72c	55c	68c	54c	58c	52c	62c	54c	71c	65c	72c	70c	38,300
Miner Boy	Colo													1.60	1.55	1.70	1.60	1.70	1.50	1.55	1.50	1.55				6,100
Mono, G	Cal.	750	5,000,000	50,000	100	275,000	Dec..	1880	50																	
Moose Silver	Colo		3,000,000																							
North Standard, G	Cal.																									
Quicksilver preferred	Cal.	8,500	4,291,300	42,913	100	*								23c	21c	32c	2 c	21c	18c	20c	18c	20c		20c	19c	7,100
" common	Cal.	acres.	5,708,700	57,087	100	*								6 5c		61½		61								700
Rappahannock, G	Va	345 acres	250,000	250,000	1	*								16	15½											270
Red Elephant	Colo		5,000,000	500,000	10	*								14c		15c	14c					14c				900
Silver Cliff, S	Col.		10,000,000	200,000	50	*								30c		30c		31c	30c	30c		30c	28c	30c	27c	5,300
Silver Nugget	Ariz		2,000,000	200,000	10	*								5.00	4.85	4.90	4.85	4.95	4.85	4.85	4.75	5.10	4.70	4.80	4.40	4,950
" new stock	Ariz		2,500,000	250,000	10									10c	9c	10c	9c	10c	12c	21c	15c	25c	20c	20c	24c	72,150
South Bodie, G	Cal.	1,500	10,000,000	100,000	100	85,000	Nov.	1880	0 15							42c	40c	46c	42c	46c	42c	52c	50c	52c	48c	25,550
South Bulwer, G	Cal.	1,500	10,000,000	100,000	100	170,000	Dec.	1880	0 25																	
South Hite G. M. Co	Cal.		2,500,000	100,000	25																					
Sutro Tunnel	Nev.		20,000,000	2,000,000	10	*								42c	40c			41c								600
Tioga	Cal.	1,500	10,000,000	100,000	100	225,000	Nov	1880	0 15					1.03	1.55	1 60		1.75	1 50	1.75	1.63	1.75	1.63	1.65	1.50	65,585
Tip-Top	Ariz	1,500	10,000,000	100,000	100	120,000	Mar	1880																50c		100
Tuscarora, S	Nev.		10,000,000	100,000	100	80,000	Oct	1880	0 15							18c	16c	16c	10c	20c	16c	23c	20c	23c	22c	8,000
Unadilla	Colo		500,000	50,000	10	*														15c	14c	14c	13c	15c	13c	12,800
Union Cons. G. S	Nev.	800	10,000,000	100,000	100	1,060,000	Mar.	1881	1 00					6.75				6.50		7 50	7.25					250
Vandewater	Nev		2,000,000	200,000	10	*								16c	52c	18c	52c	17c	12c	58c	53c	57c	54c	54c		6,300
Willshire	Cal		50,000	50,000	1	*												1.20	1.15	1.55	1.50	1.60	1.50	1.50		3,500

G. Gold. Silver. S. 1, Lead. C. Copper. *Non-Assessable. †The Deadwood mine paid in dividends, previous to the consolidation, $275,000. Total shares sold during the week, 1,049,780

pears to be a highly creditable one, and also one which the stockholders should have every reason to be satisfied with. Mr. Goff informs us that he purposes leaving for Colorado by the first of May, to take personal charge and superintend the business affairs of the company during the summer.

A telegram from Philadelphia, dated March 20th, says :

The stockholders of the Amygdaloid Mining Company, operating one of the copper-producing properties in the Lake Superior region, met at the office in this city yesterday for the purpose of taking some action to relieve the company from its financial embarrassments. There are many claims against the mine, and the strain is so severe as to prevent present development. The stockholders were informed that unless they agree to pay the mortgage upon the property, the mine will be foreclosed by means of a sheriff's sale. This bit of information was not richly relished by the holders of stock, whose only anticipation has been in the direction of dividends.

The agent of the Mining Associated Press at Virginia City, Nev., says :

The question of the reduction of miners' wages for work on the upper levels of the Comstock has been agitated here considerably of late. What the result will be can not yet be told. No proposition has yet been submitted to the unions. At present, an agreement exists between the mines and the unions that no one not a member of the unions shall be allowed to work underground, and that no less than $4 per day shall be paid. Before this agreement was made, the mines were put to considerable expense for surgeons and nurses in case of accidental injuries to miners while on duty. Another condition of the agreement was, that the miners should take care of their own sick and wounded. In an interview to-day with a leading member of the Virginia Union in regard to the proposed reduction of wages on the upper levels of the lode, he said : I do not believe the miners will consent to it. There are 16,000 members of the unions on the coast, and they all regard our Comstock unions as the head of the organization. In no other place have the mines reached the depth of 2400 feet, and the proposed reduction is for labor above that level. In the present depressed state of things here, and the existing wants of laboring men, it would doubtless be advantageous to the community and to many of our members if these could be put to work even at $3 per day on the upper levels. But should we consent to it, it would be the signal for a reduction to $3 per day for labor in the mines at all other points. Thus, while perhaps 500 men would be benefited here, many more would be injured elsewhere. Hence, I say, I do not think our miners will consent to the reduction. One thing, however, they will doubtless consent to, and that is an increase of the hours of labor to ten or even twelve, if those who are employed see fit to accede to such an agreement in order to get work. Further than this they will not go. Besides, the percentage of the cost of running mines which is paid for labor is very small. A much greater reduction in expenditures can be made by getting wood and timber and all kinds of supplies at a much less cost. This can be effected through reductions in freights and in the price of water, and no one suffer by it. Wood should be laid down here for $7 per cord ; it now costs $10 on the track. Timbers cost $17 per thousand ; they can be laid down for $11. The mines pay from $250 to $600 per month for water, and the mills here accordingly ; this should be reduced 50 per cent. When these reductions are made and the cost of living here diminished accordingly, it will be time to ask the miners to work for less wages.

OFFICIAL LETTERS.

Belmont.—At a recent meeting of the trustees of this company, whose mine is located in Montana, it was decided to add twenty stamps to the company's mill, also new boilers and a 100 horse-power Corliss engine, which will compress air for the use of the mine, when power drills will be used.

Big Pittsburg.—The manager, under date of March 22d, says :

I think the mine will pay current expenses, and leave a handsome monthly surplus ; the new shaft is down 30 feet.

Bull-Domingo.—The superintendent has received orders to partially suspend work at the mine. Sixty men are thrown out of employment. The object is to push down a 500-foot main shaft as quickly as possible ; also to avoid excessive transportation charges until a railroad is completed to Silver Cliff.

Centennial-Sapphire.—In a letter dated Lida, Nev., March 14th, the superintendent states :

The east drift on the 84-foot level is about four feet wide and six feet high. I am running north toward the footwall, and have made five feet, all in good milling ore. I propose to *know* how wide the ledge is, and expect to find it from 16 to 25 feet wide. As soon as the foot-wall is reached, I will run for the hanging-wall. After ascertaining how wide the ledge is at this point and on what side or where the very rich ore is, I will set men "chloriding" or taking out rich ore and sacking it for shipment. Meanwhile, the deep shaft goes steadily down. I got a little brick 1000 fine, weighing eight ounces, from 24 ounces of ore. I find this richer ore distributed all through the ledge, which is very hard and compact.

Empress.—The superintendent reports that the main shaft is down 370 feet, and that the ore is increasing in richness as depth is attained. The pay-crevice is 3½ feet wide.

Head Center.—The superintendent telegraphs that the strike in the Sulphuret mine is on the Head Center cross-vein, and that it adds $500,000 to the value of Head Center property. Drifts are being widened and stations opened preparatory to starting the mill on rich ore about the 5th of April. Ten stamps are being added to the mill.

Hite.—A report just received from the superintendent, recently sent from this city to manage the Hite mine, states that the winze sunk from the 800 to the 900 level has struck the ore-chimney, and the ore has been found to be of the same high grade as that which gave the Hite mine its great fame. The new owners propose to build an additional forty-stamp mill, which will give them a milling capacity of eighty stamps.

Hortense.—The foreman of the Hortense mine telegraphs :

Winze below No. 3 level shows 16 inches of ore, and the body is still widening. Sixty pounds of average mineral assays 191 ounces silver and 1 ounce gold. No. 1 level has 4 inches of mineral, 60 pounds of which assays 112 ounces silver and some gold.

Little Chief.—The manager, under date of March 19th, says :

During the week ended to-day, we have shipped 61 tons and settled 172 tons. The proceeds amounted to $10,000. No great change in mine since last report. If any thing, a slight improvement.

Lucerne.—It is officially reported that the vein of silver-lead ore recently struck in the Lucerne mine has already widened out to about 12 inches, and that ore is mined from it for sale to the smelters.

Spring Valley.—The superintendent reports that the south shaft on tunnel line is down 48 feet, 30 feet being through the best prospecting gravel which he has seen in Cherokee during a residence of ten years. The gravel is light-blue in color, free from large boulders, and not cemented.

SAN FRANCISCO MINING STOCK QUOTATIONS.

Daily Range of Prices for the Week.

NAME OF COMPANY	CLOSING QUOTATIONS. Mar'h 18.	Mar'h 19.	Mar'h 21.	a 22.	Mar'h 23.	Mar'h 24.	Opening. Mar'h 25.
Alpha	.....	2⅝	2⅝	2⅝	2⅝	.....	.....
Alta	1⅝	1¾	1¾	1¾	1¾	1¾	.....
Argenta	.....	.....	.....	.....	.....	.....	.....
Bechtel	.....	.....	.....	.....	7-16	½	.....
Belcher	1¼	1⅜	1¼	1¾	1½	.....	.....
Belle Isle	.....	.....	.....	.....	.....	.....	.....
Belvidere	.....	1-16	11-32	.....	.....	.....	.....
Best & Bel.	6¼	6¼	6⅜	6¾	6¾	7⅜	.....
Bodie	5⅞	5½	6	5⅝	5⅞	.....	.....
Bullion	¼	11-32	5-16	5-16	5-16	5-16	.....
Bulwer	.....	1¾	.....	1⅞	.....	.....	.....
California	29-32	29-32	29-32	15-16	15-16	1	.....
Chollar	1⅝	1¾	1¾	1¾	1¾	1¾	.....
Con. Imp	.....	.....	.....	.....	.....	.....	.....
Con. Pacific	.....	29-32	1	1	.....	.....	.....
Con. Va	1½	1⅝	1½	1⅝	1⅝	1⅝	.....
Crown P'int	1	1⅛	1¼	1¼	1¼	1⅛	.....
Eureka Con	25	25	.....	23½	23	24	.....
Exchequer	11-16	22-32	27-32	29-32	¾	27-32	.....
Goodshaw	19-32	.....	.....	27-32	¾	.....	.....
Gould & Cur	3¼	3¼	3⅜	3⅜	3⅜	3⅞	.....
Grand Prize	1	28-32	¾	27-32	¾	13-16	.....
Hale & Nor.	3⅛	3¼	3¼	3¼	3⅛	3¼	.....
Mar. White	.....	.....	.....	.....	3-32	.....	.....
Mexican	4⅛	4⅛	4¼	4⅜	4⅜	4¾	.....
Mono	15-16	29-32	¾	¾	13-16	29-32	.....
North. Belle	13⅜	13½	.....	13¾	13⅞	13½	.....
Noonday	.....	1⅞	.....	1¾	1⅞	1¾	.....
Ophir	3⅜	3¼	.....	3⅜	3¼	3¼	.....
Orig. K'ys'e	.....	.....	.....	.....	.....	.....	.....
Oro	27-32	29-32	27-32	13-16	¾	11-16	.....
Overman	9-16	9-16	21-32	21-32	21-32	21-32	.....
Potosi	2	2	2	2	2	2¼	.....
Savage	1½	1½	1⅝	1¾	1⅝	1¾	.....
Scorpion	1	1⅛	1⅛	1⅛	1⅛	.....	.....
Sierra Nev.	6¼	6¼	6½	6⅝	6⅜	6⅝	.....
Silver King	22½	23	23	23	23	23	.....
So. Bulwer	.....	.....	.....	.....	.....	.....	.....
Tioga	.....	.....	.....	.....	.....	.....	.....
Tip Top	3⅞	3¾	4	.....	4⅝	4½	.....
Tuscarora	.....	.....	.....	.....	.....	.....	.....
Union Con.	6⅜	6⅜	6½	7	6⅝	6⅞	.....
Utah	.....	.....	.....	.....	.....	.....	.....
Wales	15-16	1	15-16	.....	.....	13-16	.....
Yel. Jacket	2½	2⅝	2¾	2¾	2⅝	2¾	.....

REVIEW OF THE SAN FRANCISCO MARKET.

There is no noteworthy change in any of the stocks included in this list, and the quotations are almost a repetition of those given a week ago.

The following dispatch from San Francisco to-day is quite significant, and if the "air-current" referred to will permit of uninterrupted work in the lower levels of the Yellow Jacket mine, the value of this company's property should be correspondingly enhanced :

The Sutro Tunnel was connected with the Yellow Jacket mine early this morning.

There is a fine current of air down through the Yellow Jacket shaft.

In this connection, the following telegram will be of interest :

SAN FRANCISCO, March 18.—A private letter says that John W. Mackey has bought out the interests of two Scotchmen who held large blocks of Sutro Tunnel stock. This gives color to the story that the Bonanza firm controls the tunnel.

The New York *Herald* of March 22d says :

The upward movement in Sutro Tunnel stock is justified by the fact that Mr. Mackey has been negotiating with the McCalmonts, and has secured a refusal for the whole of their interest, amounting to some 900,000 shares, in addition to a mortgage upon the property. He seems to have been induced to make the purchase by the steadily growing importance of the low-grade ore extracted from the so-called Brunswick lode. The New York Metallurgical Works in Washington street, in this city, have made exceptionally successful experiments in working the ore by an improved process. The lode is about 12,000 feet from the mouth of the tunnel, and has a width of 200 feet. Some 1200 feet of the lode are the absolute property of the tunnel, and all the rest of the lode will be a tributary to the company, since it can only be worked through the tunnel and will be subject to a royalty. Assays as high as $30 per ton have been obtained, though no workings deeper than 150 feet from the surface have yet been made. Some $700,000 have already been taken out of the six claims comprising the lode.

Sinking has been resumed in Union shaft, and the joint winze with Sierra Nevada has been commenced.

The output of the Comstock lode for the week ending March 19th amounted to 1080 tons of ore, which yielded average assays of $33.

It is reported that the Bonanza firm has closed a contract for $200,000 cords of wood for the Comstock mines.

Copper and Silver Stocks.

Reported by C. H. Smith, 15 Congress street, Boston, Stock Broker and Member of the Boston Mining and Stock Exchanges.

BOSTON, March 24.

The market for mining stocks at the regular stock exchange the past week has been extremely dull, and prices are lower, with no prospect of any increasing activity at present. Ingot copper is lower, which has had a depressing effect upon the copper stocks, and there is no disposition to purchase, even the investment securities, while the speculative list is absolutely neglected. The silver stocks show more animation ; but the bulk of the business in this line is done at the New Mining Exchange, where large transactions are recorded in a few specialties.

Calumet & Hecla has ruled quite steady at a decline of $1@$1½ from last week ; sales, $244½@$245.

Central sold at $35 for 50 shares, the first sale since February 7th, which was at $40.

Nothing done in Copper Falls.

Franklin declined from $14¼@$13, and recovered to $13⅝ ; closing $13 bid, $14 asked.

Pewabic declined from $18¼ to $16, at which price 200 or 300 shares were sold, since which it sold at $17@$16½, and closed $16 bid.

Quincy has been the firmest stock on the list, the decline being only $½ ; sales at $33, which was bid and none offered.

A single sale of Osceola at $37 comprises all that was done in this stock.

Blue Hill opened at $4¾, advanced to $5, but declined to $4⅝.

Huron sold at $4⅛.

Allouez, $3⅛@$3¾.

Douglass, $3⅛.

Star at $1⅝.

Phœnix, $2½.

Breece, $2,

Brunswick Antimony at $19.

In silver stocks, Catalpa was most active at $2¼@$2⅛ ; sales about 5000 shares.

Hars aw dull and heavy at $12@$11½.

Contentment steady at $2¾.

Silver Islet declined from $2⅜@$2⅜.

Duncan declined from $3 15-16 @$3⅛.

Empire advanced from 85c.@$1.20.

3 P.M.—There was nothing doing at the afternoon Board, and prices are unchanged.

Closing prices :

Allouez, $3@$3⅛.

Atlantic, $15.

Aztec, $1⅛.

Blue Hill, $4⅝.

Brunswick Antimony, $17.

Calumet & Hecla, $244@$245.

Catalpa, $2⅛@$2 3-16.

Copper Falls, $13¼.

Duncan, $3⅛@$3¾.

Franklin, $13@$13⅛.

Harshaw, $12.

Huron, $3@$4.

Pewabic, $16@$16⅛.

Quincy, $33.

Silver Islet, $28@$30.

Sullivan $7.

At the Boston Mining and Stock Exchange, there has been a good deal of activity, with Empire Mining and Milling Company as the special feature, large sales of which have been made at an advance from 80c.@$1.30. Other stocks have sympathized somewhat with the market, and show a small advance over last week. Boston Gold and Silver sold up to $5.65, and is very firmly held, with every prospect of a still further advance.

Coal Stocks.

NEW YORK, Friday Evening, March 25.

The coal stocks have figured in the dealings of the general stock market to a very large extent during the past week, the sales aggregating 819,410 shares. Prices have been very weak, and steadily declining until to-day, when stocks have been firmer and the market has presented a more favorable aspect.

The Delaware, Lackawanna & Western Railroad Company's directors still continue a conservative policy. At a meeting to-day, a quarterly dividend of only 1¼ per cent was declared, although it was shown that the earnings in February alone were more than enough to pay that, they having been between $400,000 and $500,000, as against a loss last year in the same month of about $100,000. It is due to the large earnings that the advance took place. The sales during the week have amounted to 619,655 shares at $126¼@$117⅝@$122¼.

Delaware & Hudson has recorded sales of 49,675 shares at prices ranging from $112⅝ down to $107⅝, recovering to-day to $110.

New Jersey Central has been very active, the sales amounting to 141,435 shares at $105⅛@$96¼.

The Reading matter still remains unsettled. The

COAL STOCKS.

NAME OF COMPANY.	Capital Stock.	SHARES. No.	SHARES. Par Val.	Last Dividend. Mo.	Y.	R't.	Rate per Ann.	Quotations of New York stocks are based on the equivalent of $100. Philadelphia prices are quoted so much per share. Mar. 19. H.	L.	Mar. 21. H.	L.	Mar. 22. H.	L.	Mar. 23. H.	L.	Mar. 24. H.	L.	Mar. 25. H.	L.	SALES.
	$		$				Per c'nt													
Am. Coal Co.	1,500,000	60,000	25	...	..	....	....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Col. C. & I.	10,000,000	100,000	10	...	..	....	....	.....	.....	52⅝	51½	51½	.....	52	49¼	51⅛	49⅛	51⅛	50⅛	4,049
Ches. & O. RR	15,000,000	150,000	100	.....	..	....	....	.....	.....	24⅛	24¼	24	.....	23¾	23⅛	23⅛	23	23⅛	23	2,025
Consol. Coal	10,250,000	102,500	100	Jan.	77	2½	....	..	..	.....	.....	.....	.....	.....	.....	37⅜	...	.....	.....	100
Cumb. C. & I.	500,000	5,000	100	.....	..	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Del. & R. C.	20,000,000	200,000	100	Aug	76	4	9	†	111¼	111⅛	110⅛	110⅛	109¼	110¼	107¼	109	107⅜	110	107¾	49,675
D., L. & W. RR	26 000,000	624,000	50	Jan.	81	1½	6	‡	125¼	125⅜	123⅝	123⅝	121¼	123⅛	118¼	120	117⅝	122⅛	118¾	619,655
Elk Lick C Co	.....	.....	..	.....	..	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lehigh C. & N	10,448,550	208,971	50	Sept	76	1½	5½	46¾	46	46⅛	46	46	45¾	46	44⅞	45¾	44¾	.....	.....	19,552
Leh. V y R. R	27,042,000	540,858	50	.....	..	....	4	62	61¾	61	.....	61	60½	60¾	60¼	60⅜	60	.....	.....	2,278
Mary'd Coal	4,400,000	44,000	100	Jan.	76	1½	1½	..	..	28	.....	.....	.....	.....	.....	25	.....	.....	.....	200
Montauk C'l.	2,500,000	25,000	100	.....	..	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morris & Es'x	15,000,000	300 000	50	July	79	3½	7	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Cen. C'l	5,000, 00	50,000	100	Dec.	80	2	....	.....	.....	28½	.....	.....	.....	28	27¼	28½	..	29¼	.....	8 0
N. J. C. & R.	20,000,000	200,000	100	Apr	76	2½	2½	§	104¼	104¾	1 2½	102¾	101¼	102	96½	99	96⅜	100¾	97⅝	141,433
Penn. Coal	5.000.000	100,000	50	Oct.	79	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Penn. R. R.	68,870,200	1,337,404	50	Nov.	80	3	....	66¼	66	66¾	65¾	65¾	65⅝	66⅜	66	66¼	65¼	.....	.....	36,681
Ph. & R. RR*.	34,278,150	685,563	50	Jan	76	2½	10	.....	.....	64	61	62	61⅜	62	57¼	59¼	57⅜	59⅞	59	52,562
Spring M.C'l	1,500,000	30,000	50	Dec.	79	3½	6	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	..	.....	..	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

*Of the sales of this stock, 28,062 shares were sold at the Philadelphia Stock Exchange, and 24,500 shares at the New York Stock Exchange.

† 112⅜. ‡ 126¼. § 105¾. Total Sales..... 819,410.

BOSTON MINING STOCKS.

NAME OF COMPANY.		Shares.	Par.	Mar. 18. H.	L.	Mar. 19. H.	L.	Mar. 21. H.	L.	Mar. 22. H.	L.	Mar. 23. H.	L.	Mar. 24. H.	L.	SALES. Shares
Acton Con	Me.	.....	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Adrie Con. c. s.	Me.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Allouez, c	Mich.	80,000	$25	.....	.....	3½	.....	3¾	.....	3½	.....	3½	.....	.....	.....	450
Arizona & Mass.	Ariz.	....	....	.97	.....	.95	.....	.....	.....	.95	.....	1.00	.....	.95	.....	1,800
Arizona Queen.	Ariz.	.....	....	1.30	.....	.....	.....	1.29	.....	1.30	.....	1.30	.....	1.30	.....	950
Atlantic, c	Me.	40,000	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Atrata	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Aztec	Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bald Mountain	Colo.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Blue Hill, c	Me.	50,000	....	4¾	....	4⅞	.....	5.00	4⅞	.....	.....	4¾	.....	4¾	4⅝	600
Bonanza Chief	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Boston, c. and s.	Colo.	.....	25	5.54	5.33	5.55	5.52	5.55	5.53	5.65	5.53	5.65	5 62½	5.65	5 62½	8,050
Boston & Eureka	.....	.....	.....	.....	.....	.....	.....	1.51	.....	.....	.....	.....	.....	.....	.....	100
Breece	.....	.....	.....	.....	.....	2.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Brunswick	Me.	.....	....	.19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50
Cal. & Hecla, c.	Mich.	100,000	10	245	.....	.....	.....	245	.....	245	.....	245	244½	.....	.....	37
Catalpa	Colo.	300,000	25	2.38	2.25	2⅛	2¼	2 9-32	2	2¼	2 3-16	2 3-16	.....	2 3-16	2¼	6,825
Central, c	Mich.	20,000	50	.....	.....	35	.....	.....	.....	.....	.....	.....	.....	.....	.....	50
Contentment	Ariz.	.....	.....	.....	.....	.....	.....	5⅞	.....	.....	.....	.....	.....	.....	.....	100
Copper Falls, c.	Mich.	20,000	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Copper Harbor.	Mich.	.....	....	.35	.....	.....	.....	.42	.....	.....	.....	.....	.....	.....	.....	200
Crescent	Mex.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Crystal Mica	Me.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dana, c	Mich.	20,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Deer Isle	Me.	.....	20	1.05	.....	.....	.....	.....	.....	.....	.....	.....	.....	.65	.....	500
Douglass	Me.	.....	.....	.....	.....	3⅛	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Duncan, s	Ont.	60,000	25	*	.....	3⅛	.....	3¾	.....	.....	.....	3¾	3½	.....	.....	250
Dunkin	Colo.	.....	....	1.67	1.65	1.72	.....	1 72½	1.72	.....	.....	1 62½	1.58	1.60	1.58	3,400
Empire	Ariz.	.....	....	1 00	.70	1.15	.94	.95	.77	1.15	.80	1 37½	1.14	1.16	1.05	†
Eureka Tunnel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Franklin, c	Mich.	20,000	.....	.....	.....	14	.....	13	.....	13¾	.....	13⅝	.....	.....	.....	450
Golden Circle	Colo.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gold Hill	Colo.	.....	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gold Stripe	Cal.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Granger, c	Me.	.....	.....	.....	.....	.....	.....	.....	.....	.85	.....	.85	.....	.....	.....	200
Gregory	Colo.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hanover	Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Harshaw	Ariz.	100,000	100	.....	.....	12	.....	12	11½	.....	.....	.....	.....	.....	.....	150
Haverly G. Grp.	Colo.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hercules	Me.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hibernia	.....	.....	....	.76	.....	.90	.80	.....	.....	.....	.....	.....	.....	.82	.....	400
Horn-Silver, s.	Utah.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Humboldt, c	Mich.	20,000	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hungarian, c	Mich.	20,000	25	.40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Huron	Mich.	.....	.....	.....	.....	4½	.....	.....	.....	.....	.....	.....	.....	.....	.....	50
International, s.	Ont.	60,000	20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Madison	Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Magnolia	S. C.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maine Mica	Me.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mass. & N. Mex	N. M.	.....	....	.62	.61	.70	.61	.75	.68	.85	.60	.70	.68	.72	.67	15,900
Mendocino	Cal.	.....	....	2.76	...	3.00	2.78	2.85	.....	2.85	.....	3.00	2.85	2.88	2.86	2,750
Mesnard, c	Mich.	20,000	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mexican	Nev.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Milton	Me.	.....	....	1.35	1.20	1.35	.....	.....	.....	1.20	.....	1 12½	.....	.....	.....	700
Minnesota, c	Mich.	20,000	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
National, c	Mich	20,000	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Mex. D. D.	N. M	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N.E. Wat'r Meter	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4½	4¼	.....	.....	100
North Castine	Me.	.....	....	3.00	2.99	.....	.....	.....	.....	2.90	.....	3.00	2 97½	3.00	.....	1,300
Osceola, c	Mich.	40,000	25	.....	.....	37	.....	.....	.....	.....	.....	.....	.....	.....	.....	6
Panther Con	.....	.....	.....	1.00	.65	.93	.83	1.30	.90	.....	.....	.....	.....	.....	.....	7,700
Pewabic, c	Mich.	20,000	25	.....	.....	17½	.....	16	.....	16	.....	17	.....	16½	.....	525
Phœnix, c	Mich.	20,000	50	.....	.....	.....	.....	2.50	.....	.....	.....	.....	.....	.....	.....	100
Pine Tree	Me.	.....	.....	.....	.....	1.15	1.00	1.50	1.45	1.75	1.50	.....	.....	.....	.....	7,000
Promontory Con	Colo.	.....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Quincy, c	Mich.	.....	....	33½	.....	.....	.....	33⅜	33¼	33⅜	.....	33	.....	33	.....	458
Revere	Me.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ridge, c	Mich.	20,000	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.50	.....	100
Rockland, c	Mich.	20,000	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rudisill	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Clair	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Salem-Sullivan	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Pedro	N. M.	.....	.....	.....	.....	4.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	200
Silver Islet, s.	Mich	40,000	25	20½	.....	.....	.....	20½	.....	29	.....	29	.....	.....	.....	225
Simpson Gold	N.C.	.....	.....	.....	.....	.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	200
So. Hite, c	Cal.	100,000	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Noonday	Cal.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Side	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Star	Nev.	.....	.....	.....	.....	.....	.....	.....	.....	1½	.....	.....	.....	.....	.....	50
Stewart	Me.	.....	.....	.....	.....	.....	.....	1 12½	1.10	1 12½	.....	1.10	.....	.....	.....	900
Sul'v'n & Wa'k'g	Me.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Superior, c	Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sutro Tunnel	Nev.	*	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Swan's Isle	Me.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sycamore	Ariz.	.....	....	1.75	1.60	1.75	1 57½	1.75	1.50	1.75	.....	1.65	1 62½	.....	.....	3,980
Tecumseh	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tremont Silver	.....	.....	.....	.....	.....	.80	.72	.....	.....	.....	.....	.....	.....	.....	.....	600
Tuolumne	Cal	.....	.....	.....	.....	1.23	.....	.....	.....	.....	.....	1.24	.....	1.23	.....	1,200
Twin Lead	Me.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Washington	Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Young Hecla	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

*3 15-16 †110,150 c. Copper. s. Silver.

argument on the question of the legality of the late election of officers began this morning in Philadelphia. The report of Mr. George M. Dallas, the chairman appointed by the court, shows that upon the day of the meeting the whole number of Reading shares was 687,648, of which 292,053 were represented at the meeting in person or by proxy; and of the latter, 278,106 had been registered for three months previously to the meeting. At the election, 211,077 shares voted, of which 208,287 had been registered three months. Of these votes, the McCalmont ticket, headed by Frank S. Bond for president, received 211,015, of which 208,225, were shares registered for three months. Franklin B. Gowen received 62 votes for president; Samuel Bradford, 211,027 votes for treasurer; and Edward L. Kinsley, 211,015 votes for secretary. There were no opposing votes cast for managers, secretary, or treasurer.

The presiding judge informed counsel that the only questions now involved are whether or not it was necessary that a majority of stockholders should be present at the election, and whether or not the election should be deferred to the succeeding year.

George M. Dallas, master, presented a supplementary report to-day saying that the number of shares of stock of the company registered as such on December 14th, 1880, and remaining registered in the same manner on March 14th, 1881, was 468,705, of which 29,952 were preferred. The sales of the stock in this market during the past week amount to 24,500 shares at $64@$57¼.

The following is a comparative statement of the business of the Philadelphia & Reading Railroad, and the Philadelphia & Reading Coal and Iron Company for the month of February, 1881:

Philadelphia & Reading Railroad Company, 1881, gross receipts from all sources, $1,136,427.69; gross expenses, $805,166.33; net profit, $531,321.36; 1880, gross receipts from all sources, $1,085,161.78; gross expenses, $687,273.65; net profit, $397,888.13. Philadelphia & Reading Coal and Iron Company, 1881, receipts, $803,625.63; expenses, $703,544.90; 1880, receipts, $530,472.35; expenses, $609,559.69; loss, $79,087.34. During February, the company mined from its own and leased lands 338,072 tons of coal; total for the year to date, 978,544 tons; February, 1880, 221,169 tons; total for 1880, for same period, 956,317 tons.

Gas Stocks.

NEW YORK, Friday Evening, March 25.

The market for this class of stocks is unsettled and rather weaker. During the week, there have been sales at the American Mining Board of 50 shares of Mutual at $68@$69½, and 37 shares of Manhattan at $185. The following auction sales are also reported:

13 shares Manhattan Gas-Light Co., $50 each.....$182
30 shares Metropolitan Gas-Light Co., $100 each ... 138½
$1480 Metropolitan Gas-Light Co. Scrip..... 102½

The Edison Electric Light Company has succeeded in obtaining the passage by the board of aldermen of a resolution permitting the company to lay tubes and wires, erect lamp-posts, etc.

Leadville, Colo., Gas.—The price of gas in Leadville has been reduced to $4.25 per thousand with a further reduction of 5 per cent on all bills paid before the first of the month.

The following list of companies in New York and vicinity is corrected weekly by GEORGE H. PRENTISS, Broker and Dealer in Gas Stocks, No. 19 Broad street, New York. Quotations are based on the equivalent of $100.

COMPANIES IN NEW YORK AND VICINITY.	Capital Stock.	Par.	DIVIDENDS. Rate per ann.	Am. of last.	Date of last.	QUOTATIONS Bid.	As'd.
	$		P. ct.				
Mutual, N. Y.	5,000,000	$100	1½	6	Jan., '81	70	71
" Bonds	900,000	1,000	3½	6	Aug. '80	100	105
N. York "	4,000,000	.....	8	4	Nov., '80	95	98
Metrop. "	2,500,000	100	10	6	Feb., '81	135	138
" Certfs	1,000,000	.....	7	3½	Feb., '81	100	105
Harlem "	1,850,000	50	.....	3	Feb., '81	65	70
Manhat. "	4,000,000	50	.....	5	Feb., '81	178	180
Brooklyn, Bkln.	2,000,000	50	.....	5	Nov., '80	113	115
Nassau	1,000,000	25	.....	2½	Jan., '80	50	55
" Certfs	700,000	1,000	7	3½	Nov., '80	90	96
People's	1,000,000	10	.....	3½	Jan., '80	25	30
" 1st m. Bonds	400,000	.....	7	3½	Nov., '80	101	104
" Bonds	100,000	.....	6	3	Jan., '81	75	80
Metrop. "	1,000,000	100	5	2½	Jan., '81	55	60
W'msb'g "	1,000,000	50	.....	2	Jan., '81	60	65
" Bonds*	1,000,000	1,000	6	3	Oct., '80	101	104
Citizens'	1,200,000	20	.....	2½	Aug., '80	45	50
" Bonds	315,000	1,000	.....	3½	Oct., '80	100	105
J. C., N. J	750,000	20	.....	7½	Jan. '81	150	155
Municipal, N. Y.	2,000,000	100	.....	5	Jan., '81	159	160
" Bonds	750,000	100	7	3½	Nov. '80	105	110
Fust'n M'nicipal	1,500,000	100	.....	.....	.....	.....	55

BULLION MARKET.

NEW YORK, Friday Evening, March 25.

DAILY RANGE OF SILVER IN LONDON AND NEW YORK, PER OZ.

DATE.	London Pence.	N. Y. Cents.	DATE.	London Pence.	N. Y. Cents.
March 19	52	112¼	Mar. 23.	52	112⅛
March 21	52	112⅛	Mar. 24.	52	112¼
March 22	52	112⅛	Mar. 25.	52 1-16	112¼

There is no change to note in the silver or sterling exchange markets, except that they are less nominal than they were stated to be a week ago, and show some signs of improvement.

BULLION PRODUCTION FOR 1881.

We give below a statement showing the latest bullion shipments. These are officially obtained from the companies, where that is possible; and where official statements can not be procured, we take the latest shipments published in those papers nearest to the mines reported. The table gives the amount shipped for the week up to the date given, as well as the aggregate shipments to such date, from the first of January, 1881.

The shipments of silver bullion are valued at $1.29·29 per ounce, Troy; gold at the standard $20.67 per ounce, Troy. The actual value of the silver in the following table is therefore subject to a discount, depending on the market price of silver. The price of silver being now about $1.12 per ounce, the following figures, where they relate to silver bullion, should be diminished by about 13½ per cent to arrive at actual value:

MINES.	States.	For the week.	Month of March.	Year from Jan. 1st, 1881.
Alice	Mont			$68,338
Barbee & Walker	Utah	$2,040	$14,650	73,155
Belmont	Mont			15,270
Bodie	Cal	9,800	16,500	87,609
Bodie Dis. Banks, etc.	"			19,138
Bos. & Colo. S. W'ks.	Colo			253,000
California	Nev			33,836
Christy	Utah		21,029	101,899
Concordia	Cal			2,234
Connor	"		10,070	28,375
Contention	Ariz	23,950	77,060	372,070
Crismon-Mammoth	Utah			12,454
Custer	Idaho			42,861
Derbic	Cal		5,490	34,189
Dexter Mill	Mont			11,000
Elkhorn Mill	Dak			5,000
Eureka Con	Nev	35,730	101,150	341,723
Exchange Silver	"			44,400
Ferry Bullion		4,710	4,710	4,710
Fresno Enterprise	Cal			9,600
Frisco M. and S. Co	Utah			46,086
Germania	"	13,524	41,274	105,964
Grand Central Mill	Ariz			10,000
Grand Prize	Nev	4,000	1,000	57,379
Hale & Norcross	"			33,090
Head Center	Ariz		9,820	9,820
Hermosa Mill	"			12,000
Horn-Silver	Utah	12,500	46,569	196,072
Idaho	Cal			51,000
Independence	Nev		14,000	14,000
Indian Queen	"			26,156
Iron Silver	Colo			171,717
Jocusita	Mex			82,000
Lexington	Mont			7,000
Little Chief	Colo			63,314
Mingo	Utah			4,554
Morgan	"			24,179
Morning Star	Colo			15,200
Mount Potosi	Nev	9,700	22,080	41,880
Navajo	"	14,000	2,000	22,981
Nevada Silver Ore		2,550	5,550	5,550
Noonday	Cal	16,060	33,480	90,193
Northern Belle	Nev	24,600	72,100	284,557
Oneida	Cal			8,684
Ontario	Utah	32,494	110,645	464,001
Ophir	Nev			5,170
Pascoe	Utah			1,650
Richmond	Nev	12,285	56,018	326,163
Sierra Nevada	"			16,775
Silver Bow	Mont			51,342
Silver King	Ariz			124,798
Standard	Cal	46,879	152,472	578,960
Star	Nev	2,800	2,800	31,213
Stormont	Utah			77,249
Syndicate	Cal			21,273
Tintic M. and M. Co	Utah		10,277	34,269
Tip Top	Ariz		38,000	147,900
Tombstone M. & M. Co	"	21,721	38,894	213,196
Union Con	Nev			43,100
Wood River	Idaho			6,450

CALIFORNIA.

Standard.—The superintendent reports that during the week ending March 24th, 1280 tons of ore were shipped to the mill; average pulp-assay, $29.88. Crude bullion received 4250 ounces. Shipments to San Francisco amount to about $46,879.15.

COLORADO.

Kent Co.—It is stated that this mine has increased its daily yield to 35 tons for the quartz mills, and 5 tons to the smelters.

The Leadville *Circular* of March 19th gives the following table of the approximate daily output of the leading mines of the camp at the present time:

Mines.	Tons.	Mines.	Tons.
Miner Boy	12	Carbonate Hill	3
Florence	8	Henriette	30
Little Silver	12	Evening Star	65
Colorado Prince	0	Dunkin	15
Little Pittsburg	25	Robert E. Lee	45
Chrysolite	50	Silver Wave	20
Little Chief	20	Little Giant	5
Iron Mine	250	Crescent & Etna	10
Silver Cord	20	Highland Chief	25
Catalpa	15	Comstock	5
Fryer Hill	0	Matchless	30
Amie	0	Hibernia	5
Oro La Plata	60	Climax	0
Glass-Pendery	0	Great Hopes	0
Morning Star	30	Dyer	6
Columbia	5	Others, say altogether	30
Argentine	15	Etna	10
Virginius	0	Agassiz	5
Half-Way House	20		
Robert Emmet	10	Total, tons	851

Leadville Gold and Silver Mill Co.—March 18th, this company shipped bar No. 159, weighing 1272 ounces, 992 fine, and worth $1413.24.

Silver Wave.—The shipments are estimated at from 50 to 60 tons per day, averaging about $45 per ton.

Boston & Colorado.—These works have made a change in the price of the purchase of gold and silver-bearing ores. On silver ores they deduct 10 per cent of the assay value, charging $22 per ton for treatment; on gold ores 10 per cent is deducted, and $20 per ton charged for treatment.

Breece.—It is stated that this mine ships daily 50 tons of ore to Pueblo and 20 tons to the smelters.

Iron Silver.—The managers report for the week ending March 9th as follows: Ore delivered this week, 1784 tons; amount received, $25,803.52; tons delivered unpaid for, 1788.

DAKOTA.

Caledonia.—The superintendent reports that the mill was shut down on the 6th to clean up after 20 day's run. The bullion product for that period was $13,104.

A correspondent, writing from Belleview, Wood River, under date of February 20th, to the New York *World*, gives the yield of certain mines in the Wood River District as follows:

Mines.	Shipments. Tons.	Silver yield per ton. Ounces.	Per centage lead.
Elkhorn	150	146	56
Erwin	11	131	56
Ontario	11	130	57
North Star	32	80	70
Idahoan	66	140	78
Ornament	5	690	50
Mayflower	30	150	75
Wild Irishman	4	150	75
Bullion	50	200	60
White Cloud	12	160	60
Vienna	20	450	..
Lucky Boy	4	900	..
Garrard	10	150	75

The writer, in commenting upon the above, observes: All these lots of ore were either from the surface croppings or within fifty feet of the surface, and they are all from mines which have only been worked a few months, and for the first time during the summer months of 1880.

IDAHO.

The Vienna mine, in the Saw-Tooth Mineral Belt, has two tunnels run in, from which have been extracted 400 tons of ore, worth from $100 to $500 per ton, produced from simple development-work alone. One shipment of twenty tons of ore to Salt Lake last fall yielded $400 per ton, while several smaller shipments did considerably better. A ten-stamp mill is now building for the Vienna.

The Columbia, owned by Cortright & Co., of New York City, has been pretty well explored during the past summer, several shafts and open cuts exhibiting a splendid continuous ore-body 600 feet long, which yields from $100 to $1000 per ton. Selected lots of ore thus far shipped from the Columbia returned $600 per ton. The vein is from five to seven feet wide. From this, hundreds of tons of ore worth from $100 to $2000 per ton have been taken. One five-ton lot shipped to San Francisco yielded $4500, and small masses worth $5000 to the ton are frequent.

MONTANA.

Butte.—The shipment of silver bullion through the Butte express office, for the week ending March 12th, footed up 3738 pounds, valued at $59,808. This is $21,648 more than last week's shipment.

Little Jenny.—A recent report states that the last shipment of 39 tons of ore from this mine averaged 119 ounces silver and $10 gold per ton.

NEVADA.

Comstock Mines.—The *Territorial Enterprise* publishes the following mine reports for the week ending March 4th:

	Tons of ore raised.	Assay value per ton.
California	310	$40.05
Consolidated Virginia	310	36.55
Sierra Nevada	310½	.....

Exchange Silver.—A recent dispatch states that bar No. 27, amounting to $1200, has been shipped to the New York office.

NOVA SCOTIA.

Our correspondent reports the following:

Salmon River Mott Mine.—The crushing of a lot of 45 tons from this mine gave 102 ounces.

Sherbrooke.—The yield of this mine for the month of February was 283 ounces 6 dwt. from 374 tons of quartz.

UTAH.

Park City Smelter.—The bullion shipments from the Park City smelter for the week ending March 12th were as follows:

	Bars.	Weight—lbs.
March 7th	223	22,004
" 12th	224	22,106
Total		44,110

MISCELLANEOUS.

Bullion Receipts from the Mines to New York.—The bullion received from the mines at the various offices in this city during the week ending with yesterday, as compiled from various sources, amounts to $296,245.88, as against $398,083.29, reported in our last.

The Gold Flood.—There was received at the Assay Office, for the week ending March 18th, of foreign gold $592,000, making the total receipts of foreign coin from August 2d, 1880, $65,192,000, and of American coin $5,913,600; in all, $71,105,600, as against $73,415,000 in 1879. The payments by the Assay Office in coin and bars to bankers were $1,570,000, being a total from August 2d, 1880, of $15,192,000.

The steamships Germanic and Rhein, which arrived at this city on Sunday from Europe, brought $500,000 and $29,585 in gold and silver respectively.

The steamer Wyoming brought on the 23d inst. $500,000 in bullion to the bank of British North America.

LONDON, March 25.—The *Standard's* financial article says it is estimated that £120,000 in specie was purchased in open market for shipment to America yesterday. The greater portion came from France and Russia yesterday.

The weekly statement of the Bank of France shows an increase of gold to the amount of 27,039,000 francs, and an increase of silver to the amount of 2,250,000 francs, making a total increase of 29,289,000 francs.

The Transportation of Silver Coin.—WASHINGTON, March 20.—The following circular relative to obtaining silver coin from the United States Treasury was issued yesterday by Secretary Windom. In accordance with the provisions in the act making appropriations for the sundry civil expenses of the government, approved March 3d, 1881, to wit: That the Secretary of the Treasury be and he is hereby authorized and directed to transport, free of charge, silver coin, when requested so to do, provided that an equal amount of coin or currency shall have been deposited in the Treasury by the applicant or applicants, until further notice; fractional silver coin and standard silver dollars will be sent by express, free of charge, if so requested, under the regulations of this department, in sums of $500, or any multiple thereof; or by registered mail, free of charge, if so requested, in sums of $60, or any multiple thereof not exceeding $300, at the risk of the person to whom sent. Any correspondence pertaining to this matter should be addressed to the Treasurer of the United States, Washington, D. C.

The Treasury Department has ordered the transfer of $4,754,734 in gold bullion from the New York Assay Office to the United States Mint at Philadelphia, for coinage into eagles and half-eagles.

Bi-Metallic Nations.—LONDON, March 24.—The *Times*, in its financial article this morning, says it is assured that there is some ground to anticipate that France and the United States will agree to become bi-metallic nations for a certain period. It is hoped that the countries of the Latin Union will follow their example; that Germany will agree to continue the suspension of the sales of silver; and that England will undertake, on behalf of India, not to give up the silver standard for the same period.

Exports of Gold and Silver from New York.

Week ending March 19th	$292,778.00
Corresponding week last year	279,256.00
Since Jan. 1st this year	2,740,839.00
Corresponding period last year	2,885,210.00

Gold Interest Paid Out by the Treasury.

Week ending March 19th	$260,376.16
Corresponding week last year	224,921.02
Since Jan. 1st this year	11,530,647.12
Corresponding period last year	13,912,496.57

METALS.

NEW YORK, Friday Evening, March 25.

The condition of the metal market, with the exception of Tin Plates, which, from an abnormal state of affairs among the makers, are higher, may be said to be very flat and uninteresting. This has been so for some time past, and this featureless condition looks as if it might continue.

Copper.—We hear of sales of some 350,000 lbs. to consumers. The market is dull, with only fair consumptive demand. We quote Lake nominal at 19¼c. and Baltimore 18¾c, both spot cash. Bids of 19c. for Lake and 18½c. for Baltimore have been refused.

Our English advices by mail include the 11th inst.

March 7th. Closing quotations for g. o. bs. may be called £60¾@£61.

March 8th. Values remain unaltered; a warrant of g. o. bs. at £60¼ sharp cash may be taken as the market price.

March 9th. Closing cash quotations for g. o. bs. were £60⅝@£60½, and rather buyers at the lower figure.

March 10th. Market inanimate; g. o. bs. sold at £60¾, and a favorite mark at £60⅝.

March 11th. There was a little more demand for Chili Bars this morning, which were taken at £60¾@£61, partly g. o. bs., partly favorite marks, and mostly for usual cash terms. On a rumor that charters were light, quotations became a shade firmer, and we call them £61@£61¼ for g. o. bs. cash.

Wallaroo dull at £72; Burra, £67 cash; English, quiet; Tough Cake, £64@£65¼; Select Ingot, £66@£67¼; India Sheets, £69¼@£71; Yellow Metal Sheets, 5¾@6d. per lb.

STATISTICS OF COPPER—LONDON, LIVERPOOL, SWANSEA, AND FRANCE.

		—Feb. 1 to Feb. 28.— Imports. Tons.	Deliveries. Tons.	
Fine foreign, chiefly Australian		1,222	357	London.
Chili	Bars and Ingots	2,628	1,402	Liverpool
	In Ores and Regulus	621	352	& Swansea.
Totals, England		4,471	2,111	
Fine foreign, chiefly American		5	50	France.
Chili Bars, Ingots, and Barilla		609	859	
		5,085	3,020	

		February only. —Feb. 28. Tons.	Jan. 31. Tons.	
Fine foreign, chiefly Australian		7,845	6,980	London.
Chili	Bars and Ingots	31,770	30,544	Liverpool
	In Ores and Regulus	1,065	796	& Swansea.
Totals, England		40,680	38,320	
Fine foreign, chiefly American		380	435	France.
Chili Bars, Ingots, and Barilla		5,566	5,816	
		46,626	44,561	
Chili, chartered and afloat	Mail	7,548	7,993	
	Telegram	3,300	3,500	
		57,474	56,054	

Chili G. O. Bs	£61¼	£62
Wallaroo Cake	72	72

		—Jan. 1 to Feb. 28.— 1881. Tons.	1880. Tons.	1879. Tons.
Imports	Chili	5,186	6,179	7,685
	Other foreign	1,579	1,292	2,455
		6,765	7,471	10,140
Deliveries	Chili	5,764	10,019	6,417
	Other foreign	893	1,820	2,055
		6,657	11,830	8,472

Tin.—With no metal offering in large lots, 20c. is the nominal quotation. There is a good jobbing line of business transacting at 20¼c. We quote all brands nominal at 20¼c. The market closes steady but dull.

By cable to-day, London quotes £88 for spot stuff, and £89 10s. for futures. Penang, $27.10, Singapore, $27.60.

Our English advices by mail include the 11th inst.

March 7th. On March 5th, there was a fair trade at 87⅛s. sharp cash and ordinary 14 days. To-day on first 'Change, cash parcels changed hands at 87⅝@87⅛s.; on second 'Change, cash parcels sold at 87⅛@87⅜s., closing rather buyers at the highest figure.

March 8th. Not much doing; small sales at 87⅛@87⅜s. sharp cash, 87¼@87⅛s. usual prompt. Closing rates were 87¼@87⅛s. customary terms.

March 9th. Quiet; moderate demand for cash parcels at 87⅛@87¼s.

March 10th. On first 'Change, Australian and Straits changed hands at 87⅛s. sharp cash. On second 'Change, buyers offered 87s. sharp cash, which was declined, and 87⅛s. asked.

March 11th. Australian and Straits sold at 86⅞@87s. cash.

The Dutch Trading Company has declared 23,400 pounds of Banca for sale on the 30th inst.

STATISTICS OF FOREIGN TIN IN LONDON AND HOLLAND.

	Imports. Tons.	Deliveries. Tons.	
	—Feb. 1 to 28.—		
Australian and Straits	2,345	1,370	London.
Banca (ex sale)	Nil	402	Holland.
Billiton	77	200	Holland.
Total	2,422	1,972	
In transit—Straits, nil; Australian, 50 tons	50	50	
Total	2,472	2,022	

	Feb. 28. Tons.	Jan. 31. Tons.	
	—Stocks.—		
Australian and Straits	7,988	7,013	London.
Banca (ex sale)	1,169	1,571	Holland.
Billiton	1,718	1,841	Holland.
Total	10,875	10,425	
Approximate quantity afloat: Austr'an.	1,900	2,100	
Straits	900	2,000	
Billiton	1,600	1,000	
Total	15,275	15,525	
Australian and Straits	£88	£90½	

	January 1 to February 28. 1881. Tons.	1880. Tons.	1879. Tons.
Sales of Banca by Trading Co	572	624	609
Imports—Billiton	350	378	757
" Straits	1,940	358	1,070
" Australian	1,524	2,417	1,469
Total brought to market	4,386	3,777	3,845
Actual deliveries of foreign	3,590	3,458	3,207
In transit—Straits and Australian.	850	1,295	272

	—February.— Imports. Tons.	Approximate shipments. Tons.
Australian	810	600
Straits	1,535	225
Total	2,345	825

N. B.—Straits imports include 225 tons from America.

Tin Plates.—In consequence of trouble among the makers in England, some works closing down and others failing, and the stocks being reduced by the demand, the market on the other side especially, as well as here, has become much stronger, and prices in England have advanced from 6d. to 9d. per box. We quote per box as follows: Charcoal tins, Melyn grade, ¼ cross, $6⅛@$6¼; Allaway grade, $5⅞@$6, Charcoal Roofing, Dean grade, $5⅝ for 14 × 20, and $11⅞ for 20 × 28; Allaway grade, $5¼@$5⅝ for 14 × 20, and $10⅜@$10½ for 20 × 28. Coke Roofing, B. V. grade, $5 for 14 × 20, and $10 for 20 × 28. Coke tins, A. B. grade, IC, $5⅜@$5½; B. V. grade, $4.90@$5; ICW, $4.40@$4.50 for 14 × 20.

Messrs. Robert Crooks & Co., of Liverpool, under date of March 10th, say of tin and terne plates:

The combination of low prices with increased cost is, as anticipated, beginning to tell severely on manufacturers One suspended payment this week, and it is feared others must soon follow suit. As a natural consequence of this state of things, suppliers of tin and tin bars, whether coke, charcoal, or steel, are restricting their credits, and deliveries of plates are increasingly difficult to get. While the temporary effect of the pressure may be to further depress prices, ultimately there is little doubt selling figures will advance to an approximation to cost. This will mean an all-round advance of at least 1s. Meantime there is no change to note except for stock sizes of cokes, which are procurable from second hands in greater quantity and variety at the lowest figures.

Exports of tin plates from Great Britain to United States, compared with corresponding period of 1880 and 1879, month ended February 28th:

1881. Tons.	1880. Tons.	1879. Tons.	1881. $	1880. $	1879. $
11,114	10,257	9,137	102,558	230,830	160,360
Two months ending February 28.					
23,291	27,270	18,132	407,649	593,687	312,573

Pig-Lead.—This metal is very quiet, with nothing doing but a jobbing trade. Common we quote at 4·65c. and Refined at 4¼c. asked. The shipments over the San Francisco Railroad Company, for the week ending March 14th, were 177 tons. The *Age of Steel*, under date of St. Louis, March 19th, says:

Last week, we quoted the better quality of the article at 4·65c., at which several hundred tons changed hands. No such price has been realized since then, the tendency being steadily and surely downward. During the earlier part of the present week, sales were made at 4·625@4·6c.; but at the time of this writing, buyers are not to be found who are anxious to trade on a basis of 4·5c. for soft, the poorer qualities being difficult to dispose of at any price. The transactions for the week aggregate sales of about 500 tons. A party who had a ten-car lot for sale in the earlier part of last week, and declined 4·65 for it—his demand being 4·70—has his lead on hand to-day, and it is doubtful if he could get 4 50 for it.

Spelter and Zinc.—We quote the former quiet at 5½@5¼c. for Western, and 5⅝@5¾ nominal, for Silesian. For the latter in sheets, we quote 7c.

The *Age of Steel*, under date of St. Louis, March 19th, says:

We have no change to remark in the quotations or situation of the spelter market; dull and nominal.

Antimony.—Quiet; we quote Cookson's at 15c., and Hallett's and Johnson's at 14⅝@14¾c.

Quicksilver.—The San Francisco *Commercial Herald*, under date of March 10th, says:

Exports to Mexico, 700 flasks. The demand for China of late has been light. Sales during the current month are reported at 36½@37c., running up to 38c. The London quotation is given at £6 15s. ₱ bottle.

The exports for the week, by sea, were as follows:

	Flasks.	Value.
Totals	900	$26,321
Previously since January 1st, 1881	6,353	182,608
Totals	7,253	$208,929
Totals same period 1880	4,456	138,471
Increase in 1881	2,797	$70,458

Receipts since January 1st, 1881, 9146 flasks.
Overland shipments from January 1st to February 1st, 1881, 1255 flasks.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, March 25.

The week under review has been a very quiet one for the sales departments of the iron trade. Fortunately, the efforts of this branch at an earlier day enable the producing companies to make large deliveries now, and as a consequence prices show no weakness worthy of note. An important feature of the iron trade is the increasing cost of production. The prices of coal and ore are high, and now comes an increase in wages. It is announced that the Thomas Iron Co. has voluntarily increased the wages of its workmen 10 per cent. The other companies will have to do the same, and in some instances it will probably be more than the companies can stand.

American Pig.—We do not learn of any business worthy of note. The inquiries are small, deliveries large, and prices quite firm. We quote No. 1 Foundry at $22@26; No. 2 Foundry, $22@$23; and Forge, $20@$22.

Scotch Pig.—The arrivals are moderate, and are absorbed as they arrive. Glasgow quotations are weak, while freights are higher, owing to the large movement of hematite iron ore, Bessemer pig, rails, etc., the rates at present ranging between 7s. 6d. and 12s. 6d. We quote Eglinton at $21½@$22; Glengarnock, $23; Gartsherrie, $23@$23½; and Coltness, $24½.

Messrs. John E. Swan & Brothers, of Glasgow, under date of March 11th, 1881, report 120 furnaces in blast, as against 114 at the same time last year. The quantity of iron in Connal & Co.'s stores was 530,473 tons, an increase of 2406 tons for the week. The shipments show a decrease since Christmas of 42,104 tons, as compared with the shipments to the same date in 1880. The imports of Middlesbrough pig-iron for the same period show a decrease of 6745 tons. The following were the quotations of the leading brands of No. 1 pig iron: Gartsherrie, 58s.; Coltness, 59s.; Langloan, 58s. 6d.; Summerlee, 58s.; Carnbroe, 55s.; Glengarnock, 55s.; Eglinton, 50s. Middlesbrough pig-iron was quoted as follows, f. o. b.: No. 1 Foundry, 42s. 6d.; No. 2, 40s. 6d.; No. 3, 38s. 6d.; No. 4, 38s.; No. 4 Forge, 37s. 6d.

Messrs. J. Berger Spence & Co., of Manchester, England, under date of March 12th, say:

The general position of the pig-iron trade is a shade better than it was last week, as far as prices are concerned, and this may be attributed in a great measure to the excessively low limits ruling recently, precluding much probability of a further decline. Buyers, therefore, have more freely operated during the week, and sellers have been enabled to maintain a slightly firmer attitude. Glasgow market led the van, and its influence was made the most of at Middlesbrough. Warrants, although they have fluctuated, are now from 6d. to 1s. per ton higher, and at the moment their position seems tolerably secure. No. 3 Middlesbrough is now quoted at from 38s. 6d. to 39s., the latter in isolated cases only, and for deferred delivery; No. 4 Foundry and No. 4 Forge being 6d. and 1s. per ton respectively under No. 3. Inquiries are more plentiful, but it is difficult to obtain large orders at full prices. Shipments of Middlesbrough iron last week showed an improvement, being 15,718 tons. Hematite iron has been less active, and quotations are not so steady. This, however, is not general, and only applies to a few makers. Derbyshire and Lincolnshire rates more nearly approach those of Middlesbrough; but a very limited business has been done, consumers being rather largely bought.

Rails.—We learn of no business worthy of note, and in the absence of the same quote as in our last. We note a sale of 5000 tons of steel blooms to be imported and sent to Pittsburg.

Old Rails.—We note a sale of 1500 tons of Ts. to arrive in Philadelphia at $27¾. We quote at $27¼@$28, and D.Hs. $29@$30.

Scrap.—This is without business; we quote at $30@$31 from yard.

We publish the following letters from our regular correspondents:

Cincinnati. March 22.

[Specially reported by JACOB TRABER & Co.]

We have experienced a quiet market for the past week; prices however, remain firm, especially for favorite brands of CC and coke irons. Low-grade irons are in abundance, prices rather favoring buyers. We quote:

	Four mos.
No. 1 Hanging Rock Charcoal Pig-Iron	$27.00@$27.50
No. 2 " " " "	26.00@ 26.50
No. 1 Tennessee " " "	26.00@ 27.00
No. 1 Hanging Rock Coke "	24.50@ 25.00
No. 2 " " " "	23.00@ 23.50
No. 1 Jackson Co. Stone Coal "	20.00@ 23.00
H. R. C. B. Car-Wheels, all Nos	40.00@ 42.00
Southern C. B. Car-Wheels, all Nos	38.00@ 39.00
Virginia " " " "	39.00@ 40.00

Louisville. March 22.

[Specially reported by GEORGE H. HULL & Co.]

The market continues quiet, with a steady and good demand from consumers. Prices on standard brands are fully maintained. Inferior brands are pressing on the market, and could probably be bought at a little under prices of last week.

FOUNDRY IRONS.

	No. 1.	No. 2.
Hanging Rock Charcoal	$27.00@$28.00	$26.00@$30.00
Southern Charcoal	24.00@ 25.00	22.00@ 23.00
H'n g Rock, Ste'l & Coke	23.50@ 24.00	22.50@ 23.00
Southern Stonecoal & Coke	23.50@ 24.00	22 50@ 23.50
"Amer. Scotch"	$23.00@$24	Silver Gray. $19.00@$22.00
Scotch Iron	25.00@ 26	

MILL IRONS.

No. 1 Charcoal, Cold-short & Neutral	$22.00@$24.00
No. 1 Ste'l & Coke, Cold-short & Neutral	22.00@ .....
No. 2 Ste'l & Coke, Cold-short & Neutral	21.00@ 21.50
No. 1 Missouri and Indiana, Red-short	26.00@ 27.00
White & Mottled, Cold-short & Neutral	19.00@ 20.00

CAR-WHEEL AND MALLEABLE IRONS.

Hanging Rock, Cold Blast	$35.00@$42.00
Alabama and Georgia, Cold Blast	35.00@ 40.00
Kentucky, Cold Blast	35.00@ 40.00

Richmond. March 21.

[Specially reported by ASA SNYDER.]

The tone of the market continues firm. Transactions for the week in Scotch irons have been small. American makes are in good demand. Old rails are stronger and inquiries numerous. Sales show no change in prices of last report.

Scotch Pig-Iron	$24.00@$26.00
Amer. Scotch Pig-Iron	27.00@ 29.00
American " " No. 1	25.00@ 28.00
" " " No. 2	22.00@ 25.00
" " " No. 3	21.00@ 23.00
" " Mottled and W	19.00@ 21.00
Best Charcoal Wheel Iron	38.00@ 41.00
Va. Cold Blast Charcoal Pig-Iron, neutral	....
" Warm " "	....
Old Rails	26.00@ 28.00
Old Wheels	28.00@ 29.00
Wrought Scrap No. 1	22.00@ 25.00
Cast Machinery Scrap	21.00@ 22.00
Richmond Refined Bar Iron	2 6·10@ .....
Horseshoes (Tredegar)	4 00@ .....
Mule-shoes "	5.00@ .....

St. Louis. March 19.

[Specially reported by HOFFER, PLUMB & Co.]

The market is quieter, but prices are firm. We quote for cash as follows:

HOT BLAST CHARCOAL.

Missouri	$28.00@29.00
Southern	26.00@28.00
Hanging Rock	29.00@.....

COKE AND COAL.

Missouri	None offering
Southern	$25.00@26.00
Ohio	24.00@26.00

MILL IRONS.

Cold short	$22.50@23.00
Red short	26.00@.....

CAR-WHEEL AND MALLEABLE IRONS.

Missouri	$32.00@35.00
Southern	35.00@38.00
Ohio	35.00@43 00

John H. Austin & Co.'s Special Market Report.

LONDON, E. C., March 10.

STEEL RAILS.—£6 2s. 6d.@£6 15s. per ton; market quieter. Although several parcels of 56-pound American sections have been placed on the basis of £6 2s. 6d. per ton, f. o. b., the best-known makers will not sell under £6 7s. 6d. per ton, f. o. b. Light sections command 5s.@7s. 6d. per ton more.

IRON RAILS.—£5 5s.@£5 12s. 6d. per ton; very quiet market, with a few transactions recorded in 35 and 40-lb. sections.

BAR IRON.—£5 5s.@£5 7s. 6d. per ton for ordinary assortments.

OLD RAILS.—Market steady. O. D. Hs. have been in request for spring and summer shipments to Baltimore, Philadelphia, and New Orleans; but the transactions have been limited to about 4000 tons for the former port, at about 85s. per ton, c. i. f.

HEAVY WROUGHT SCRAP-IRON.—70s.@72s. 6d. per ton, f. o. b.; fair inquiry, but freight difficulties stand in the way of business.

OLD RAILWAY LEAF SPRING STEEL.—Inquired for, but nothing offering; nominally; £5 15s.@£6, c. i. f. U. S. ports.

OLD CAST-IRON RAILWAY CHAIRS.—43@45s. per ton; very small business doing with local founders.

STEEL BLOOMS, 7″ × 7″ AND UPWARD.—Wanted for prompt and summer shipment; £5 17s. 6d.@£6 per ton asked; but this is rather higher than buyers can pay.

BESSEMER PIG-IRON, Nos. 1, 2, AND 3.—60@65s. per ton; very dull market.

SCOTCH PIG-IRON.—Stocks increasing, through over-production and small shipments. Cash price to-day, 49s.

MIDDLESBROUGH PIG-IRON. No. 3.—Same position as Scotch; to-day's price, 38s.@38s. 3d. prompt.

COAL TRADE REVIEW.

Anthracite.

NEW YORK, Friday Evening, March 25.

The event of the week has been the issuing of spring circulars announcing reductions in prices, amounting to from about 10c. to 25c. per ton. The majority of the companies were, we are informed, opposed to a reduction; but on the 21st inst. the Pennsylvania Coal Co. announced prices for delivery at Newburg as follows:

Lump	$3.95	Stove	$4.05
Steamer	3.95	Chestnut	3.90
Grate	3.85	Pea	2.90
Egg	3.90		

and the other companies promptly met what they considered an easy compromise. The Delaware & Hudson Canal Co. quotes for shipment from Weehawken as follows:

Lump, steamer, and grate	$3.90	Stove	$4.20
Egg	4.05	Chestnut	4.00

The Delaware, Lackawanna & Western RR. Co.'s prices are the same as the above, with the exception of chestnut, which this company quotes at $3.90, and pea at $3.15. Wilkes-Barre coal is quoted the same as Scranton. The Lehigh and Wilkes-Barre Coal Company quotes Honey-Brook Lehigh as follows:

Lump	$5.00	Stove	$4.25
Broken	4.25	Chestnut	3.90
Egg	4.25		

The Philadelphia & Reading Coal and Iron Company quotes as follows:

FROM PORT RICHMOND.

	Lump	Steamboat.	Broken.	Egg.	Stove.	Chestnut.	Pea.
	$	$	$	$	$	$	$
Hard white-ash coal.	4.50	4.50	3.90	3.90	3.90	3.55	2.80
Free-burning white-ash coal	.....	.....	3.55	3 70	3.85	3.55	2.80
N'rth Franklin white-ash coal	.....	.....	3.55	3.70	3.85	3.55	2.80
Schuylkill red-ash coal	.....	.....	.....	3.70	3.95	3.55	2.80
Shamokin coal	.....	.....	.....	3.90	4.10	3.55	2.80
Lorberry coal	.....	.....	.....	4.25	4.25	3.65	....
Lykens Valley coal (Brookside)	.....	.....	4.65	4.65	4.65	4.00	.....

FROM ELIZABETHPORT, N. J.

	Lump.	Steamboat.	Broken.	Egg.	Stove.	Chestnut.	Pea.
	$	$	$	$	$	$	$
Hard white-ash coal.	4.85	4.85	4.25	4.25	4.25	3.90	3.15
Free-burning white-ash coal	.....	.....	3.90	4.05	4.20	3.90	3 15
North Franklin white ash coal	.....	.....	3.90	4.05	4.20	3 90	3.15
Schuylkill red-ash coal	.....	.....	.....	4.05	4.30	3.90	3.15
Shamokin coal	.....	.....	.....	4.25	4.45	3.90	.....
Lorberry coal	.....	.....	.....	4.60	4.60	4.00	.....
Lykens Valley coal (Brookside)	.....	.....	5.00	5.00	5.00	4.35	.....

It is said that the companies are quite harmonious. Although we do not anticipate any actions that will enable buyers to secure, later in the year, cheaper coal than at the present time, there has evidently been some ill feeling engendered during the past fortnight. The public has heard enough of programmes during several years past, and will only show confidence in the *actions* of the companies. To run full time means ruinous competition among the producers, while over-production, be it only a couple of million tons, will be but little better.

Although we do not believe in combinations as permanent benefits to trade, yet we do believe in fully and not half carrying out an adopted plan. Believing that the companies will enforce the curtailment plan for regulating prices, we believe that it would be better for both the companies and the public if this were rigidly impressed upon the public mind by a literal enforcement of the restriction immediately. There will be a very large amount of coal required this year; and if the public waits too long, it will certainly have to pay very much higher freights and very likely much higher prices for coal. All matters considered, the present time appears to be as advantageous as any for those with capital to lay in supplies.

Prices have been very much demoralized, and are not fully over it yet. We learn of concessions from the new circulars. There has been considerable improvement, however, during the past three or four days. There is more business doing, but it is not sufficient to absorb a full production, and any failure to take prompt action relative to a further curtailment will be a set-back to public confidence.

The Western trade has fallen off considerably. Some of the railroads refuse to take shipments of coal previous to the delivery of large accumulations along the various lines. Some shipments have met with delays of a month and six weeks in transit.

The production of anthracite coal last week was 511,850 tons, as compared with 592,888 tons for the previous week, and 340,234 tons the corresponding week of 1879. The total production from January 1st to March 19th was 5,199,091 tons, as against 3,956,826 tons for the like period of last year, showing an increase this year of 1,242,265 tons.

Our Philadelphia correspondent, under date of March 24th, says:

The trade is dull and the new circular has not so far given sufficient confidence to buyers to make them order. Either the prices are to advance as the season progresses or they are not. If they are, there must be a sharper decline now; and if they are not, there is no inducement to buy early. To suppose that no decline in the spring and an advance during the season is a practicable programme is not wise. It would lead in a very few years to such prices as would render anthracite an article of luxury and very much diminish its consumption.

Freight, $1.50 to Boston, $1.25 to the Sound.

Bituminous.

There is a very fair business in this class of coal at prices a little weak. We learn of no important contracts.

New York.

Retail Prices.

Per ton of 2000 lbs.

Anthracite.

	G. & Egg.	Stove.	Chest.
Lack. Coal, delivered below 59th St.	$5.50	$5.75	$5.50

Pittston, $5.00@$5.25, for all sizes, according to location.

Wholesale Prices of Anthracite Coal Delivery f. o. b. at Tide-Water Shipping Ports, per ton of 2240 lbs.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
WYOMING COAL.	$	$	$	$	$	$
* Pittston at Newburg	3 95	3 95	3 85	3 90	4 05	3 90
Scranton at Hoboken	3 90	3 90	3 90	4 05	4 20	3 90
Lackawanna at Weehawk'n	3 90	3 90	3 90	4 05	4 20	4 00
Wilkes-Barre at P. Johnston	3 90	3 90	3 90	4 05	4 20	3 90
Plymouth R. A. at P. John.	.....	.....	3 90	4 15	4 35	4 00
LEHIGH COAL.						
Honey Brook at Port John.	5 00	.....	4 25	4 25	4 25	3 90
Cross Creek at Port John	.....	.....	.....	.....	.....	.....
Up. L. & Coun. Ri'geat Eliz'pt	.....	.....	.....	.....	.....	.....
SCHUYLKILL COAL. *At Elizabethport.*						
Hard White Ash	4 85	4 85	4 25	4 25	4 25	3 90
Free-Burning White Ash	.....	.....	3 90	4 05	4 20	3 90
Schuylkill Red Ash	.....	.....	.....	4 05	4 30	3 90
Shamokin	.....	.....	.....	4 25	4 45	3 90
Lorberry	.....	.....	.....	4 60	4 60	4 00
Lykens Valley (Brookside)	.....	.....	5 00	5 00	5 00	4 35
At Port Richmond, Philadelphia, for shipment to points beyond Capes of the Delaware.						
Hard White Ash	4 50	4 50	3 90	3 90	3 90	3 55
Free-Burning White Ash	.....	.....	3 55	3 70	3 85	3 55
Schuylkill Red Ash	.....	.....	.....	3 70	3 95	3 55
Shamokin	.....	.....	.....	3 90	4 10	3 55
Lorberry	.....	.....	.....	4 25	4 25	3 65
Lykens Valley (Brookside)	.....	.....	4 65	4 65	4 65	4 00

* Fifty cents per ton additional for delivery at New York.

MANUFACTURING AND STEAM COALS.

Per ton of 2240 lbs.	At the Shipping Ports.	Alongside at New York.
Cumberland at G'n & Alexandria	.....	.....
Cumberland, at Baltimore	.....	.....
Clr'fi'd "Eureka" and "Franklin."		
At mines	$1.20	....
At Baltimore	3.75	....
At Philadelphia	3.75	.....
At South Amboy	4.65	$5.00

F. o. b.

STATISTICS OF COAL PRODUCTION.

Comparative statement of the production of anthracite coal for the week ending March 19th, and years from January 1st:

TONS OF 2240 LBS.	1881. Week.	1881. Year.	1880. Week.	1880. Year.
Wyoming Region.				
D. & H. Canal Co.	76,050	763,275	43,812	655,861
D. L. & W. RR. Co.	81,332	864,983	57,050	683,106
Penn. Coal Co.	18,938	218,147	21,976	147,113
L. V. RR. Co.	27,512	236,548	9,788	201,002
P. & N. Y. RR. Co.	1,611	10,253	334	2,718
C. RR. of N. J.	57,694	477,469	34,806	285,542
	262,937	2,570,675	168,766	1,975,342
Lehigh Region.				
L. V. RR. Co.	78,632	832,162	45,158	520,134
C. RR. of N. J.	32,779	379,843	29,343	359,545
S. H. & W. B. RR.	.....	676	.....	8,341
	111,411	1,242,681	74,501	888,020
Schuylkill Region.				
P. & R. RR. Co.	119,915	1,166,564	82,362	968,294
Shamokin & Lykens Val.	16,200	205,800	13,865	116,024
	136,115	1,372,364	96,227	1,084,318
Sullivan Region.				
St Line & Sul. RR. Co.	1,387	13,371	710	9,146
Total	511,850	5,199,091	340,234	3,956,826
Increase	171,616	1,242,265	.....	.....
Decrease	.....	.....	.....	.....

The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent of the whole production.

Total same time in 1876	1,827,043 tons.
" " " " 1877	3,192,502 "
" " " " 1878	2,587,749 "
" " " " 1879	4,289,386 "
" " " " 1880.	3,956,826 "

Belvidere-Delaware Railroad Report for the week ending March 19th:

	Week.	Year. 1881.	Year. 1880.
Coal for shipment at Coal Port (Trenton)	103	103	131
Coal for shipment at South Amboy	19,998	128,243	85,022
Coal for distribution	12,349	181,104	98,459
Coal for company's use	1,926	24,527	22,266

The decrease in shipments of Cumberland Coal over the Cumberland Branch and Cumberland & Pennsylvania Railroad amounts to 54,998 tons, as compared with the corresponding period in 1880.

The Production of Bituminous Coal for the week ending March 12th was as follows:

Tons of 2000 lbs., unless otherwise designated.

	Week. Tons.	Year. Tons.
Cumberland Region, Md.		
*Tons of 2240 lbs	41,682	314,587
Barclay Region, Pa.		
*Barclay RR., tons of 2240 lbs	9,833	101,136
Broad Top Region, Pa.		
*Huntingdon & Broad Top RR.	5,750	53,050
East Broad Top	1,947	14,261
Clearfield Region, Pa.		
Snow Shoe	1,444	13,501
Tyrone and Clearfield	46,196	361,859
Alleghany Region, Pa.		
Pennsylvania RR.	7,250	54,629
Pittsburg Region Pa		
West Penn RR	7,076	70,164
Southwest Penn. RR.	197	8,087
Penn & Westmoreland gas-coal, Pa. RR.	15,931	175,839
Pennsylvania RR.	10,664	129,333

* For the week ending March 19th.

The Production of Coke for the week ending March 12th, and year from Jan. 1st.

Tons of 2000 lbs.

	Week.	Year.
Connellsville Region (Allegheny Region)	2,382	19,988
West Penn RR.	2,148	18,444
Southwest Penn. RR.	30,902	301,709
Penn. & Westmoreland Region, Pa. RR.	3,530	34,892
Pittsburg, Penn. RR.	10,571	83,828
Snow Shoe (Clearfield Region)	131	1,687
Total	49,664	460,458

The French and Belgian Coal and Iron Trade.

During the second half of last year the production of mineral combustibles in France amounted to 10,013,797 tons, of which 9,736,713 tons were coal and anthracite, and 276,884 tons lignite. As compared with the second half of 1879, this production shows an increase of 615,482 tons. The aggregate production of mineral combustibles in France for the whole of 1880 was 19,412,112 tons, as compared with 17,110,979 tons in 1879, showing an augmentation of 2,301,133 tons. It was in the departments of the Pas-de-Calais, the Nord, the Loire, the Gard, and the Saône-et-Loire that coal mining made the most progress last year. The demand for domestic qualities of coal has been in a very languishing state in Austria for some time past, in consequence of the mild weather which has prevailed of late. As regards industrial coal, the spring

season appears to be thus far promising well. The German coal trade has acquired a much more quiet tone. The demand has fallen off, and there are also some apprehensions that prices may very possibly give way. The total consumption of coal in Berlin last year is estimated at 1,494,000 tons, of which 114,000 tons came from England.

The Belgian iron trade appears to be in rather an uncertain state, and it is difficult to predict the course which affairs will take. At present prices are pretty well established, and the construction workshops have employment assured to them for some time to come. The rolling mills have also plenty to occupy them during March, while some of them are occupied for a longer period. Iron has been generally quoted in Belgium at £5 4s. per ton; the fact has, however, not escaped attention that the demand for iron is falling off in Germany, and this may, of course, have some influence upon Belgian prices. English pig has been held in Belgium at £2 7s. 2d. per ton. Plates have not experienced much change upon the Belgian markets. No. 2 has been currently dealt in at £7 4s. per ton. The Selessin Company has just completed the great bridge over the Volga at Syzran, for which it contracted at St. Petersburg in 1874. The length of this bridge is 4767 feet; the quantity of iron absorbed in its construction was about 10,000 tons, and the cost of the materials used was £140,000. The iron was supplied by the Selessin and Cocullet companies. The bridge has sustained satisfactorily severe tests, and it is now opened for traffic. A new undertaking has been started under the style and title of the Baume Forges and Rolling Mills Company.

There has been scarcely any change in prices in the Haute-Marne, and the current of affairs has continued satisfactory. First-class iron from coke-made pig has brought £7 12s.@£8 per ton; while mixed iron has been quoted at £8 8s.@£8 12s. per ton. The demand for sheets appears to be improving; No. 20 iron wire has been in great demand at £9 12s. per ton. There are a good many orders on hand in the Nord, and in some quarters there are anticipations of an advance in quotations. Refining pig has been quoted in the Longwy group at £2 12s. 10d. per ton. The Paris, Lyons & Mediterranean Railway Company has just sold some old rails at £5 2s. per ton, and some fish plates at £4 16s. per ton. The production of pig in France in 1880 amounted to 1,733,102 tons, as compared with 1,400,286 in 1879; of iron to 952,308 tons, as compared with 857,071 tons in 1879; and of steel to 384,626 tons, as compared with 333,265 tons in 1879. In these latter totals steel rails figured for 279,847 tons, as compared with 253,742 tons in 1879. There is little change to note in the general tone of the German iron trade.

The state of the Belgian coal trade has remained sensibly the same. The market for industrial coal has been quiet, without much change one way or the other.—*Colliery Guardian.*

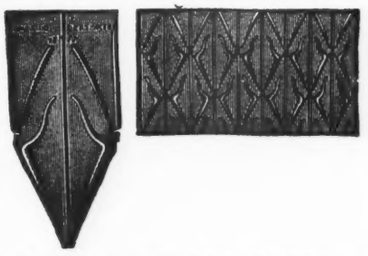
The English Iron Trade.

The downward movement of prices in the English crude iron market has been fortunately arrested, and though it would be premature to say how far the slight improvement experienced will prove permanent, there are signs of a coming change full of encouragement even to the most timid. The lowest level of price was reached last week, and the consequence of the rally this week will be to inspire more confidence, a feeling which appears to have made itself felt already in several markets. Although stocks of pig-iron at Glasgow and elsewhere are extraordinarily heavy, larger than ever before, it must not be entirely lost sight of that consumption is growing with the production of crude iron. The manufactured-iron market still continues quiet, but the steel trade is displaying renewed vitality. Ship-building operations, now the weather has fairly broken, are in full swing again, and engine works, boiler-makers, and makers of heavy iron and steel are beginning to feel the effects of that briskness. Orders for railway rolling stock are also becoming more abundant. The English coal trade is getting quieter, and rates are easier.

The Glasgow warrant market has been subject to much fluctuation this week, more activity prevailing. On Tuesday, quotations had risen almost 1s. per ton above the bottom prices of last week, but this advance was lost again on Wednesday. Still, the closing quotations on that day left a slight improvement, being 49s. cash and 49s. 1½d. a month; sellers 1d. per ton more. The Cleveland pig-iron market has also assumed a somewhat better tone. At Tuesday's market at Middlesbrough more activity set in, and the price rose fully 6d. per ton, most sales being recorded at 38s. 3d. for prompt delivery. Finished iron is quiet. The Newcastle pig-iron trade has changed but little; prices of Cleveland pig, however, have slightly improved No. 3 being sold at 40s. @ 40s. 3d. per ton delivered at Newcastle, and No. 4 forge 39s. 6d. Manufactured iron, on the contrary, has receded 2s. 6d. per ton. The West Cumberland iron trade is still active, but the tone of the market keeps quiet, although the larger requirements presently will necessitate an increased output at the furnaces. The steel trade is very busy, but that for finished iron is not in a satisfactory state. The Durham pig-iron trade, owing to better advices from Scotland, has improved this week. But while production keeps on at the present rate, prices will be low. There is no improvement yet in the iron market of Leeds and West Yorkshire. The iron trade of South Yorkshire has not changed from the previous week. In the Sheffield district, however, great firmness prevails, consequent upon larger demands from Scotland for shipbuilding purposes. Hematite iron keeps quiet in North Lancashire, and the steel branch continues active. The Lancashire market is also quiet, and prices are less firm. The demand for merchant iron continuing to fall off in North Staffordshire, quotations have become weaker all round; orders from boiler-makers and bridge-builders, however, are coming in in fair numbers. Pig-iron keeps steady. The South Staffordshire market has not improved, although manufacturers of finished iron are doing better. The sale of pig-iron at last week's rates is difficult. The Birmingham iron market is weak, business being exceptionally slack for this time of year. The quotations both for pig and finished iron have suffered in consequence. The hardware trade is also dull, but inquiry continues for galvanized sheets, machinery for export, and constructive iron work. The pig-iron trade of the Forest of Dean is unsatisfactory, and quotations have had to be lowered. The general steadiness of the South Wales iron market is not interrupted.

While the iron markets of the continent have not escaped being somewhat disturbed by the weakness of the English market, their tone has suffered but very slightly. The abundance of work especially tends to maintain their steadiness, manufacturers being not in the last inclined to make concessions. The French iron market, which began to show signs of relaxing, has been rendered vigorous once more by the announcement that the French government will soon come forward with another large order (180,000 tons) for rails. The Belgian market, which had also become quieter on the receipt of the unfavorable news from England, will for the next month or two probably experience no change for the worse, work being secured for some time yet, and by the end of that period, orders for abroad, it is hoped, will revive its drooping spirits. Latest advices from Brussels are especially hopeful. The German iron trade, likewise to some degree affected by the news from the United Kingdom, need fear no relapse while orders for material are so freely given out as at present. Work is for the time still plentiful, and consequently manufacturers make no concessions in prices.—*Iron.*

METALLIC SHINGLES.



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Important to Cotton Men.

FLEMINGTON, FLA., Jan. 6, 1881.

S. F. HAYWARD, Gen'l Agt.

BABCOCK FIRE EXTINGUISHER,

407 Broadway, New York.

DEAR SIR: Herewith please find order on New York in settlement for Babcock Extinguisher recently purchased of you. I have just used the Extinguisher in my cotton gin, and it proved successful. I would have lost my building and about ten thousand dollars' worth of cotton had been without it.

Yours, etc., J. M. REDDICK.

TO BE SOLD.

The Lancaster County SILVER, LEAD and ZINC MINES,

Situated near Landisville, Lancaster County, Pennsylvania, together with Belgian Reduction Furnaces, Calcining Furnaces, Pottery, Retort Kiln, with full equipment of Crushing and Dressing machinery complete, on the most modern and improved principles, with three powerful engines for hoisting, pumping, and working all the above machinery, together with **106 Acres of Land, Farm Buildings,** 11 Dwelling Houses, Workshops, Storerooms, Offices, etc.

For further particulars, apply to

Mr. W. S. THOMPSON,
No. 13 Broadway,
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Mr. THOMAS KENT,
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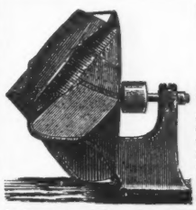
La Salle St., Chicago.

Or to PAMFORD BROTHERS,
Cheapside, Liverpool,
England.



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ENGINEERS,

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Sole manufacturers of PELZER'S PATENT MINE VENTILATOR. Efficient, durable, cheap. For any quantities of air. Small sizes for hand-power. Up to 80 per cent useful effect. Now extensively used in Germany and Austria. Full particulars and illustrated price list free on application.

DIVIDENDS.

OFFICE OF THE GREEN MOUNTAIN GOLD MINING COMPANY, OF CALIFORNIA, No. 18 Wall street, New York, March 12th, 1881.

DIVIDEND NO. 21.

The Board of Trustees have this day declared a dividend of FIVE CENTS per share for the month of February, on the capital stock of this company, payable on the 25th inst.

Transfer-books close on the 18th, and reopen on the 28th of March. J. JAY PARDEE, Secretary.

OFFICE OF THE GOLD STRIPE GOLD MINING COMPANY OF CALIFORNIA, No. 18 Wall street, New York, March 12, 1881.

DIVIDEND No. 3.

The Board of Trustees have this day declared a quarterly dividend of FIFTEEN CENTS per share on the capital stock of this Company, for the quarter ending February 28th, payable on the 30th day of March, 1881.

Transfer-books close on the 23d inst., and reopen on the 1st of April, 1881.

J. JAY PARDEE, Secretary.

OFFICE OF THE STARR-GROVE MINING COMPANY, No. 2 Nassau street, corner Wall street New York, March 16th, 1881.

DIVIDEND No. 5.

The Board of Trustees have this day declared the regular monthly dividend of $20,000, being ONE PER CENT ON THE CAPITAL STOCK of the Company, or TEN CENTS PER SHARE, payable on the 31st inst., at this office.

The transfer-books will be closed from the 25th to the 31st inclusive. JOHN R. BOTHWELL, Secretary.
WM. S. CLARKE, President.

SAN FRANCISCO, 15th March, 1881.

THE FATHER DE SMET CONSOLIDATED GOLD MINING COMPANY

HAS DECLARED DIVIDEND No. 10,

of Twenty-Five cents per share, payable at the office of

LAIDLAW & CO., 14 WALL ST., NEW YORK,

1st April, 1881, on all stock issued from the New York Agency.

Transfer-books will close on the 21st inst., and reopen on the 2d April. H. DEAS,
2t-Mar19-26. Secretary.

DIVIDEND No. 19.—LA PLATA MINING AND SMELTING COMPANY.—Office of La Plata Mining and Smelting Company, of Leadville, Colo., 58 Broadway, Rooms 12 and 13, New York, March 17th, 1881.

DIVIDEND NO. 19.

The Board of Trustees have this day declared a dividend of SEVEN AND ONE HALF CENTS per share (par value $10), on the capital stock, payable on Friday, April 1st prox., at the office of the company. Transfer-books will close on Friday, March 25th, and reopen Saturday, April 2d, 1881.

Statement of the financial condition of the Company.

Working capital	$100,000.00
February 1, 1881—Balance surplus account	53,940.83
March 1, 1881—Net earnings month of February	15,340.20
	$169,281.03
Dividend of 7½ cents per share, 200,000 shares.	15,000.00
Balance March 1, 1881	$154,281.03

D. OLYPHANT TALBOT, Assistant Secretary.

The New Pulsometer

Will save over Fifty per cent in Fuel with greater duty than any other Steam Pump in the market; also, more Simple, Durable, and Compact. Specially adapted to Mining, Railroads, Steamboats, Paper Mills, Chemical and Gas Works, Tanneries, Breweries, Sugar Refineries, and other Manufactures. For Draining Quarries, Cellars, Plantations, and various other purposes. For Contractors use it has NO EQUAL.

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PULSOMETER STEAM PUMP CO.,

P. O. Box No 1533. **Office, No. 83 John St., New York City**

BOSTON, March 22, 1881.

TO THE STOCKHOLDERS OF

"THE BOSTON GOLD AND SILVER MINING COMPANY."

GENTLEMEN:

Since accepting the Presidency of your Company, it has been my ambition, in coöperation with your Board of Directors, to so conduct the affairs of the Corporation as to place it as soon as possible among the list of dividend-paying companies, and to acquire, from time to time, either by purchase or consolidation, such additional well developed Mining properties in Colorado and elsewhere, as would give it a leading position among the great mining corporations of this Continent, fully believing that Mining is as legitimate and honorable as any business in the world, if honestly and intelligently conducted. Few branches of business pay better profits than Mining when conducted in a business-like manner.

For some months past, your Directors have had plans under consideration for acquiring some of the richest mines in Colorado, and for largely extending the operations and profits of your Company. These plans are identical in character with those under which the great railroad consolidations of this country have been made during the past few years, and, I am happy to say, they meet with the strongest indorsements from leading Financiers, Bankers and Capitalists, as well as from Mining Men generally, to whom I have submitted them.

Acting in accordance with this policy, I have to announce to you the purchase, by your Company, of the great "Dolly Varden Mining Estate," situated in Park County, Consolidated Montgomery Mining District, Colo., an estate consisting of about three hundred (300) acres of the richest mineral lands in Colorado.

The purchase was completed about five weeks ago, and the character of the property has been so fully explained and commented upon by the public press that I do not consider it necessary to recapitulate in this circular; therefore will confine myself to the financial part of the transaction, and explain the terms of purchase, manner of payments, and probable future of the property.

The Dolly Varden group of Mines, situated on Mount Bross, were discovered and *located* some eight years ago by the Hon. Assyria Hall, present State Senator from Park County, and George Brunk, Esq. These two gentlemen have since worked the property in partnership, making for themselves independent fortunes from the product of the Mines. Something over One Million Dollars' worth of ore has been taken from less than two acres in area, while the whole property has been largely developed, showing enormous ore-bodies, and satisfactory evidence that the whole mountain is composed of pay mineral; the ore runs from 100 to 1200 ounces of silver to the ton, the average being about 350 to 400 ounces.

It is the intention of your Directors to build a tramway from the mines down to the base of the mountain, which will reduce the cost of transportation of the ore from $2.50 per ton (the price now paid) to about 25 cents per ton; also to build a reduction-works to treat all the low-grade ore on the ground, instead of shipping it to the different smelters.

It is estimated by competent engineers that it will cost about $50,000 to construct the tramway and reduction-works, and when constructed, both will more than pay for their entire cost in less than twelve months' time.

The following Statement will explain the purchase and manner of payments:

STATEMENT.

The DOLLY VARDEN MINING ESTATE, purchased by the BOSTON GOLD AND SILVER MINING COMPANY for.....	$400,000
Paid on account.....	100,000
Balance due.....	$300,000
Capital required for construction of tramway and reduction-works.....	50,000
	$350,000

To enable the Company to complete their purchase and acquire the necessary additional capital, it was proposed to issue bonds for $350,000, said bonds to bear 6 per cent interest, and to be retired by 15 annual payments as follows:

		Interest.	Installment on Capital.	Total amount to be paid each year.
1st year, six per cent on	$350,000	$21,000	$24,000	$45,000
2d " "	326,000	19,560	24,000	43,560
3d " "	302,000	18,120	24,000	42,120
4th " "	278,000	16,680	24,000	40,680
5th " "	254,000	15,240	24,000	39,240
6th " "	230,000	13,800	23,000	36,800
7th " "	207,000	12,420	23,000	35,420
8th " "	184,000	11,040	23,000	34,040
9th " "	161,000	9,660	23,000	32,660
10th " "	138,000	8,280	23,000	31,280
11th " "	115,000	6,900	23,000	29,900
12th " "	92,000	5,520	23,000	28,520
13th " "	69,000	4,140	23,000	27,140
14th " "	46,000	2,760	23,000	25,760
15th " "	23,000	1,380	23,000	24,380
		$166,500	$350,000	$516,500

It is estimated by competent experts that the "Dolly Varden" property will alone produce at least $250,000 net profit per annum; add to this the proceeds from 12,000 to 15,000 tons of ore on the dump, which we believe will return the Company a net profit of between $200,000 and $300,000, and the probable profits of the other property belonging to the Company, say 560 acres rich placer grounds and other lode veins at Breckenridge, and it will be seen that, besides paying for the property from its own product, it will pay handsome dividends upon the capital stock of the Company.

As soon as the property was purchased, your Directors authorized their financial agents, Messrs. Goff, Hastings & Co., to negotiate the bonds of the Company, and although it is only five weeks since the purchase papers were signed, I am pleased to report to you that they have succeeded, through their English correspondents, in placing the bonds at ninety-seven and one half per cent (97½ per cent) on the London market.

I have to congratulate you on the great success of this loan, as well as on the solid value of your property.

Fully believing that the Boston Gold and Silver Mining Company has a brilliant and profitable future, and again congratulating you upon the present position and condition of the Company,

I am, yours truly,

EDWARD H. GOFF,
President.

SPECIAL NOTICES.

RARE OPPORTUNITY FOR SAFE INVESTMENT.

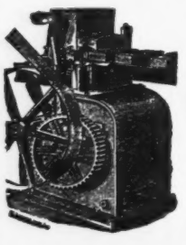
A THOROUGHLY DEVELOPED MINE, with unusual advantages for working, showing immense bodies of very high-grade ore in the stopes, which has already yielded large returns, with much water and timber rights, in a rich mineral region, is offered at much less than its determined value. It will be placed only in the hands of capitalists able and willing to continue its working in a business-like manner, without stock speculation. For further information, address THEO. B. COMSTOCK (formerly Professor of Geology in the Cornell University), 61 Broadway, Room 35, New York City.

A YOUNG MAN DESIRING TO LEARN practical mining would like to connect himself with a mine in Colorado as superintendent's assistant, ultimately buying an interest if desired.
Address C. C., MINING JOURNAL, New York.

METALLURGIST WANTED.

A metallurgist is wanted to take charge of the Copper Works of the Orford Nickel and Copper Company at Phœnixville, Pa. One having some experience in the smelting of copper preferred. Address Box 3866, New York.

BRICK MACHINES.



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NORCROSS PATENT BLOCKS, WITH STEEL PINS.

WROUGHT IRON Connections — SELF-LUBRICATORS.

Are especially adapted for coal hoisting and mining purposes.

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HENRY B. NEWHALL, 105 Chambers street, New York
S. H. & E. Y. MOORE, 163 Lake street, Chicago.